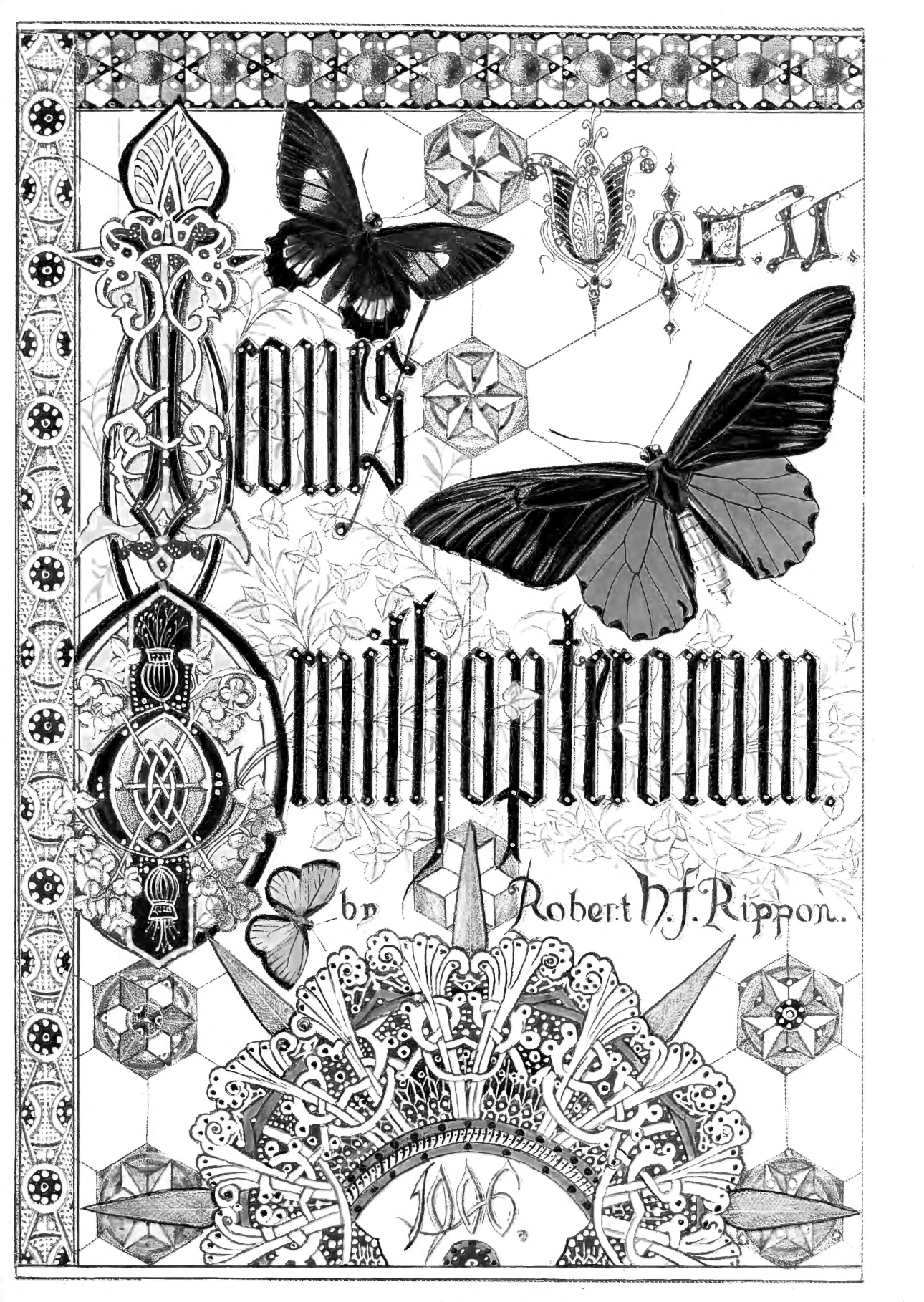
Vol. II.
Lepidoptera.
by Robert N.F. Rippon.
1906

ICONES ORNITHOPTERORUM.

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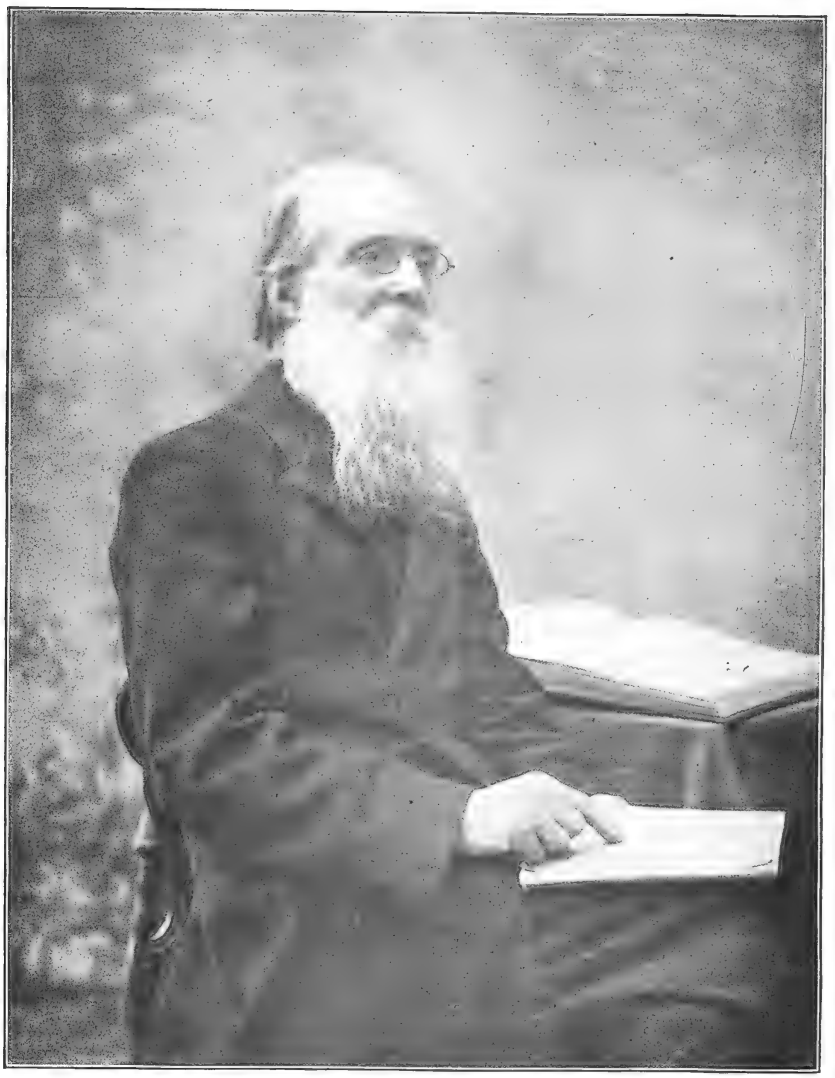

Yours faithfully,
Robert H. J. Rippon.

DEDICATED TO THE HON. WALTER ROTHSCHILD, PH.D., F.Z.S., F.E.S., F.L.S., F.R.G.S., &c.,

AND FOUNDER AND PROPRIETOR OF THE ZOOLOGICAL MUSEUM AT TRING.

ICONES ORNITHOPTERORUM:

A Monograph of the Papilionine Tribe TROIDES *of Hubner.*

OR

ORNITHOPTERA

[BIRD-WING BUTTERFLIES] OF BOISDUVAL,

BY

ROBERT H. F. RIPPON,

CORRESP. MEMBER OF TORONTO NAT. HIST. SOC., &c.

VOL. II.

With 58 Coloured and Plain Plates and Maps by the Author (in addition to 24 coloured and plain figures in the text).

"Concerning the work of my hands, command ye me. I have made the earth, and created man upon it; I, even my hands, have stretched out the heavens, and all their host have I commanded."—*Isaiah xlv., 12, 13 (Revised version).*

"The works of the Lord are great, sought out of all them that have pleasure therein."—*David, Ps. cxi., 2.*

"Seigneur! tu es digne de recevoir la gloire, l'honneur, et la puissance; car tu as créé toutes choses, et c'est par ta volonté qu'elles subsistent et qu'elles ont été créées."—*St. John, Rev. iv., 11.*

"Cuan grandes son tus obras, oh Jehova! muy profundas son tus pensamientos."—*David, Salmos xcii., 5.*

"Con las obras de tus manos me regocijo."—*David, Salmo xcii., 5.*

"Siehe, also gehet sein Thun; aber davon haben wir ein gering Wörtlein vernommen? Wer will aber den Donner seiner macht versteben?"—*Hiob xxvi., 14.*

"Lo, these are a part of His ways; but how little a portion is heard of Him? But the thunder of His power who can understand?—*Job xxvi., 14.*

"O Jehova, quam ampla sunt tua opera! Quam sapienter ea fecisti! Quam plena est terra possessione tua!"—*Psalm civ., 24, David (according to Bishop Lowth).*

"For we are His workmanship, created in Christ Jesus for good works."—*St. Paul, Ephesians ii., 10.*

"What God is there in heaven or in earth who can do according to Thy works?"—*Moses, Deuteronomy iv., 24.*

"Among the gods there is none like unto thee, O Lord! Neither are there any works like unto Thy works."—*King David, Psalm lxxxvi., 8.*

Creation, Redemption and Providence: these are God's triune revelation of Himself, inscribed within the limitless circle of primeval Love; and to know, serve and love Him in return, these are the sublime duty and privilege of all men.—*The Author.*

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1906.

ERRATA ET CORRIGENDA.

TEXT.

Page 1, col 2, last line, for *sub-genus* read *genus*.
,, 7, col. 2, line 19, for " Linnæus " read *Clerck*.
,, 9, col. 2, line 10 from above, for " Sulla Islands " read *Sula Islands*.
,, 10, col. 1, 3rd line from above, for " casta " read *Costa*.
,, 22, 8th line from above of Bibliography, for Standinger read *Staudinger*.
,, 24, col. 2, 6th line from above, for *O. Palleus*, read *O. Pallens*.
,, 25, last line of Additional Bibliography, for *piston* read *pistor*.
,, 45, col. 1, line 15 from above, delete *Mihi*.
,, 52, col. 1, line 3 from below, " Pompæus " should be *Pompeus*.
,, 54, the description of the ♀ should be for *Hycetus* ♀ of Rippon.
,, 55, Bibliography to Cerberus, line 11 from above, for Robbe read *Ribbe*.
,, 55, col. 2, line 6 from below, the words " For the ♀ see Pl. 57, figs. 1, 2," should read, For the ♀ "see Pl. 57, figs. 5, 6, 11, 12, 13, 14."
,, 55, col. 2, line 4 from below, " Robbe " should be *Ribbe*.
,, 58, col. 2, line 19 from above, for Sandwich Islands read *Philippine* Islands.
,, 58, col. 2, line 18, from above, for " Sandwich Islands exclusively," read *Philippine Islands exclusively*.
,, 65, col. 1, line 11 from below for Rhadamanthus, Boisd, read *Rhadamantus*, Lucas. Also in col. 2, lines 29-30 read *Rhadamantus*, and wherever in the Article " Nephereus " occurs substitute *Rhadamantus*.
,, 66, col. 2, line 16 from below, for " Dannett " read *Dannatt*.
,, 68, col. 2, line 2 from below for " Robur " read *Röber*.
,, 72, line 7 from the top, for " Rothschild " read *Lathy*.
,, 72, col. 2, line 7 from below, " Waterstradt " is the name of the collector of the variety, and not the locality.
,, 79, Footnote, col. 1, line 5 from above " *Ametebola* " should be *Ametabola*.
,, 118, 2nd line from the top for " Vol. II " read Vol. XI.
,, 130, lines 20 and 22, for " Guillemand " read *Guillemard*, also on Page 131 and 132 the name should be spelled *Guillemard*.

Whenever " Palawan " occurs it should be *Palāwan*.

PLATES.

Plate 26, line 2, delete " 7, *see text*."
,, 32, 1st line below for " Vanderpolli " read *Vandepolli*.
,, 34, 3rd line below add *Fig. 15*.
,, 41, line 2 below for " Fruhstorfer " read *Frühstorfer*.
,, 50 or Map 9, last line " P. Rhadamanthus " should be *P. Rhadamantus*.
,, 56, Figs. 3, 4, 3a, 6, should be ♀ of *Hycetus*, not Pompeus.
,, 61, substitute " Lathy " for Rothschild, after *fasciculatus*.
,, 64*b*, for " Röbur " read *Röber*.
,, 65, for Röder read Röber.
,, B. The numbering of the figures should be as follows: 1 ♂, 1a ♂, 2 ♀, 3 ♀, 4 ♂, 5 ♀, 6 ♂. Hanhart's writer completely reversed my numbers. The writing below should also be Ornithoptera Richmondia, *Gray*, 1, 1a ♂; 2 ♀. Pompeoptera Plateni, *Staudinger*, 3 ♀, 4 ♂. Trogonoptera Brookeana, *Wallace*, 5 ♀, 6 ♂.
Supplementary Plate F, for " Roder," read Röber.

[Note. The number of Plates in this Vol. is 59, not 58 as stated in the titlepage; and 83 coloured and plain figures in the text, not 24 as in the titlepage, exclusive of the Portrait. The Titlepage was printed anterior to the completion of the work, hence the discrepancy.]

VOL. I.

Page 4, col. 1, line 1, for " into 4 subgenera," read 6 *Genera*.
,, 5, 2nd paragraph, line 15 for " Reise Novare," read *Reise Novara*.
,, 36, col. 2, line 2 from above, " Glolo " should be *Gilolo*.
,, 71, 5th paragraph, 2nd line, for " past " read *part*.

AGENDA.

The Author is only partly responsible for the presumptuous admission of his portrait into this work, especially as he does not claim to be a member of the Tribe of TROIDES. For a long time he absolutely declined to entertain the suggestion of his son, Mr. E. VICTOR RIPPON (the curator of the Biological Section of the Canadian Institute) and a number of his subscribers, that his portrait would be very acceptable. The natural desire of a good Son could be resisted; but the strongly-expressed wishes of other subscribers had to prevail; and the Process blocks for the Plate were generously made in Toronto at his Son's expense. It is therefore hoped that this explanation will exonerate the Author from any charge of (what seemed to him a) vanity.

The Maps of this work were adapted chiefly from the Admiralty Charts, for which I am indebted to the kindness of the late Sir WILLIAM WHARTON, the Government Hydrographer, who most courteously sent me those I needed.

DEDICATION.

The First Volume of this monograph having been dedicated to the late Professor Westwood, I have now the pleasure of inscribing the second volume to another deservedly distinguished naturalist.

The Hon. Walter Rothschild is, we must all admit, a naturalist in the truest acceptation of the term. A man of many occupations and interests, every moment of whose time must be valuable to himself and others, he ever finds opportunities for the study of God's creations, living and dead; and whilst he is an accomplished Lepidopterist and Ornithologist, his interests are not entirely confined to these two subjects, as his splendid museum and the living creatures in Tring Park fully demonstrate. His unusual resources are employed in wise and noble ways, and he does not live unto himself. Any student of zoological science, whether English or Cosmopolitan, is always welcome to avail himself of the advantages of a study of the multitudinous treasures which find a home in the splendid museum which Mr. Rothschild has founded at Tring, in Hertfordshire. Speaking personally, I can heartily testify to the kindly and helpful interest which he has always taken in this work of mine. Every species of Troides that I have specified my need of, has been in the most genial way at once placed at my disposal, and I have often had in my possession for months at a time a considerable number of his rarest and most valuable treasures, using them as freely as if they were my own. Without such a privilege, not to mention other kindnesses, my difficulties in bringing this work to an approximately successful issue, would have been infinitely greater than they have been.

No one in the world possesses such a nearly complete collection of Ornithoptera as Mr. Rothschild has been able to bring together at Tring. Three years ago he estimated his examples of this tribe of Papilionidæ to number over 4,000, including nearly all the known species, sub-species, varieties and aberrations: since then this number has been considerably augmented. Some slight conception of the wealth of the Tring Museum may be obtained, when I say that at the same period there were over one million specimens of moths waiting to be set, and probably double that number of Lepidoptera incorporated in the collections. The insects of all orders *exhibited* to the general public are numerous, and instructively arranged. In his great Bird room (a student's room really) are more than 175,000 skins, contained in cabinets fitted into the walls and recesses from floor to ceiling, and in the general area of the room. These skins represent pretty well all the birds of the world, generally in the most perfect condition, and often with long series of the most magnificent species of birds of paradise and other groups conspicuous for their marvellous beauty. The zoological specimens of the vertebrates, to which the general public have access, are so arranged as to occupy the least possible space, consistent with the most useful and instructive display of their many features of interest: not only floors and galleries, but even the ceilings being utilised. In a room chiefly devoted to the antelopes may be found examples of all but two of the known species. The Museum also contains a wonderful zoological library, and many magnificent and characteristic photographs, immensely enlarged. Indeed the whole establishment, with its two learned assistant curators is such an enterprise as no other private gentleman has ever achieved or attempted.

Mr. Rothschild is himself a very learned and enthusiastic zoologist, and is well acquainted with the subjects in which he takes so deep an interest. For some years he has conducted and edited his *Novitates Zoologicæ*, of which, up to the present time, more than 16 large volumes have been published, many of them beautifully illustrated with monographs and papers from his own pen, and others in collaboration with Dr. Karl Jordan and Dr. Carte, in addition to papers and butterflies by Mr. Grose-Smith.

Such men as Mr. Rothschild do much to make the world richer and wiser for their presence in it. May it be many a long year before his shadow grows less, if it be the will of God in His wisdom.

Loving the works of the Creator as I do, and those who take an intelligent and practical interest in them, I speak of the subject of this dedication with a sincere and heartfelt enthusiasm. Mr. Rothschild is a man I delight to honour, infinitely more, I am certain, than King Ahasuerus delighted to honour Mordecai. He will therefore, I hope, accept this dedication as a small tribute of regard and respect.

ROBERT H. F. RIPPON.

September, 1907.

PREFACE.

In the Preface to the first volume of this monograph, I, among other matters, gave a slight reference to the labour and difficulties with which I had to contend in my desire to bring some small contribution to the commonwealth of Natural Science. Now that the work is virtually completed, I may confess that those difficulties, and the labour, have not been much diminished—it was not likely that they would be. During the 17 years since its commencement the interruptions and impediments have been many and varied; and though it has been my chief and almost entire occupation, other work had to be accomplished also. This special task however has given me much pleasure as well as anxiety, and my "Icones" has been a greater inspiration to me than any so-called sacred Icons could be to the people of the East, and, I trust, will be much more useful.

My chief desire (as I said in the first volume) has ever been, and, I hope, will ever be, not personal profit (that was not probable) or aggrandisement (that was most unlikely) for such a humble enterprise, but to leave something behind me that might be useful in making more fully known a few of the crystalised thoughts of God—of the creatures which, though they, together with a vast host of other creatures, take a comparatively low rank in the continents of life, are yet so entrancingly lovely that we are often asking ourselves, how inconceivably beautiful must be the Being who thinks and designs as He does?

For the completion of this work I desire to render grateful thanks to the Friend of all friends, Who has enabled me to succeed thus far; and while each volume is dedicated to a greater disciple of Zoological science than I can ever be in this world, my *most heartfelt* dedication is to Him who created the lovely objects of which these volumes treat, and also the grateful writer and illustrator of them. I am abundantly conscious of many defects in this work. If I had to do it all over again, I feel sure I could greatly improve it, and many regrettable blemishes would be removed; it would also be made a better and more exhaustive production, both textual and illustrative, especially if my resources were to become more ample than they have been. But the present results must be accepted for what they are, and not what they ought to have been. Our best efforts are only feeble attempts to grasp infinite perfection; and the greatest artists and masters of the world have always been most dissatisfied with the results of their labours; for all art and science, even the most advanced, are only provisional, a compromise—a step towards the unimaginable glory of a vaster life than this, where our capacities will be unfolding more and more without end.

It is my hope and prayer that whoever looks at the figures of the butterflies portrayed in the hundred or more plates of this book, irrespective of the scientific or critical feeling, they may be inspired to feel like the Hebrew anthologist when he wrote "For the Lord is great, and greatly to be praised . . . Honour and majesty are before Him; strength and beauty are in His sanctuary. Give unto the Lord the glory due unto His name." Of all the Naturalists of the world before the Christian era, David was the greatest and most inspired; for the earth and the heavens with all their glory appealed to him as they appeal even now to few people, as revelations of the wonderful mind of God, and often so entranced his contemplative mind, that it could only find partial relief in the many sublime utterances which are now common treasures to us all. In this respect and in his love to God, despite his great faults, David was, like Job and others, a man after God's own heart. May we be able, as he was, to say, "O God, Thou hast taught me from my youth: and hitherto have I declared Thy wondrous works. Now also, when I am old and grey-headed, O God, forsake me not; till I have shewn Thy strength unto this generation, and Thy power to everyone that is to come." "Blessed be the Lord God of Israel, who only doeth wondrous things, and blessed be His glorious name for ever; and let the whole earth be filled with His glory."

David, Asaph, Ethan and others could see how well dressed all God's creatures are; and we who think of the matter can feel an inspiration also in the contemplation of this fact. But One, infinitely greater than they or we, who ages after stood in the same Holy Land, with gentle and authoritative voice proclaimed to the whole world and to all future ages: "Consider the lillies how they grow; they toil not, neither do they spin, yet I say unto you that Solomon in all his glory was not arrayed like one of these. If God so clothe the grass of the field . . . . how much more will he clothe you, O ye of little faith." If I might reverentially venture to paraphrase the foregoing words of One Who spake as never man spake, I would point to these Ornithopterous gems, and say, "Consider the Butterflies how joyfully

they wing their way among the other glories of forest, mountain, plain and garden! They are some of the humblest of living creatures, they live their little span of life, and then pass away." "Yet I say unto you that *Solomon in all his glory was not arrayed like one of these.*" And the same may be said of many creatures even lower in the scale of life than these, to say nothing of the inhabitants of the vegetable kingdom. But we may rejoice still more for ourselves than for them, for we also came forth from the same creative hand for infinitely higher rank and beauty than they, to be the High Priests of Nature, to praise Him for them and for ourselves. We, in a limited degree can create beautiful and wonderful things, as our arts and sciences prove. Our pictures, our music and poetry; our machinery, bridges, cathedrals, and public buildings; our knowledge and control of the mysterious forces of Nature from radium to electricity; our mysterious lordship over the lower kingdoms of life, and our love for them and our fellow creatures, all prove that through a Herschel, a Lord Kelvin, a Lord Lister, a Darwin, a Farraday, a Virchow or a Pasteur, a Haydn or a Mendelssohn, a Titian, Corregio, or a Tadema; a Christopher Wren or Inigo Jones; a Prescott or a Macaulay; a Goethe, Shakespeare, Moliére, Browning, or a Tennyson; or even through the most unworthy of us God is ever striving to express Himself, even as He does through our greater and humbler preachers, and the lowliest of good men and women, whatever their creed: for in every work of man, save in its imperfections, I am assured we may see God's thoughts and creative powers revealed. Great indeed is the honour! But even then "it doth not yet appear what we shall be; but when He shall appear we shall be like Him, for we shall see Him as He is."

To some of our Biologists and Evolutionists the foregoing remarks may seem unscientific and out of place in a matter of fact monograph of a tribe of butterflies. I am unable to share in that opinion. I am as fully convinced an evolutionist as anyone; for I know it means a sublime attempt at a partial explanation of the universe. It is also to me an affirmation of God's ruling mind in the history of infinity; and so I think that even a Haekel, though he may not believe it, is unconsciously doing his part towards glorifying his Creator and establishing the fact of God's immanence in the affairs of the universe, just as the preachers and intellectual giants of every age and nationality have done, and are ever doing.

It is a pleasurable thought that we have our Creator's gracious invitation to study His works and ways in these words: "Ask Me of the things to come; concerning My sons, and concerning the work of My hands, command ye Me."—*Isaiah xlv., 11.*

But now it remains for me to give a few words of explanation regarding an omission in this work of a feature which I had from the first promised it should include. I refer to that group of American Papilios, following immediately after the Genus Pompeoptera, and which I propose to establish as a third group of Troides, to be called Ornithopterina. The first of these is *Papilio Chabrias* of Hewitson, from Equador and Upper Amazon, of which there are two forms, probably of the same species, namely *P. Triopus* and *P. Chabrias*: these may be united as one species, to be called *Triopus Chabrias*, and should immediately follow *Pompeoptera* or *Andromache*.

Papilio Æneides of Esper would be the type of the 2nd genus; *P. Belus* of the 3rd; *P. Childrenæ* of the 4th, and *P. Dardanus* of the 5th genus. Of course this is only a rough and provisional arrangement, to be more fully revised when the subject is entered upon. I found, on mature consideration, that as this volume has exceeded my estimated limits, and as I could not do justice to the plan sketched out above in the small space I should have at my disposal, that it would be better to leave it for the present; and for a second reason also, that I wished for the sake of my subscribers and for my own sake, to get the present work complete. So I propose to publish, at some early time hence, if I am spared life and sufficient health, a supplementary volume, to contain any new Troides that may be discovered, and the females of such as *Pompeoptera Neomiranda*, &c. (which came to hand too late for insertion in this volume). The rest of this supplement would be devoted to the consideration of the Ornithopterina.

Genus TROGONOPTERA, Mihi.

♂. Primary wings elongate, subtriangulate, somewhat tumid outward at the base, straight for nearly two thirds, then curved to the outer angle, which is not so sharply pointed as in Ornithoptera and Priamoptera, but more so than in Pompeoptera; posterior margin nearly straight in some specimens, or only slightly curved; inner margin nearly straight; discoidal cell elongate and narrow, considerably more than half the length of costa (44 out of 80 mm.); all the veins very straight; median and subcostal only moderately robust; nervules very thin and very slightly visible on upper side in the black; the distance between the basal junction of the three branches of subcostal nervures much greater in proportion than in other Ornithoptera; the 1st discocellular, and 2nd and 5th subcostals form a junction very nearly at the points of divergence in both sexes more persistently and closely than in Pompeoptera; the *Pseudoneura* (or false nervules) which occupy the discoidal cell, differ in the arrangement of their branchings from those of other groups, coming however nearest to the typical genus Ornithoptera; while they all start from the base, they appear to be divided into 2 stems as in Pompeoptera,—the lowest proceeding parallel with about half of the median nervure at a distance of 3 mm. from it, then branching off, the posterior branch curving to the base of the 2nd median nervule, the anterior to midway of the 2nd discoidal and 1st median nervules, becoming a part of the fold outside the cell. The upper stem is rather more complex, proceeds less than 1-6th from the base, then branches off very curiously—the posterior running nearly straight to the 1st discocellular nervule, the anterior divided again into two, which form a very elongated oval or loop, united again at their terminal point on the subcostal at very near to the base of the 2nd subcostal nervule. This latter arrangement is also to be found in Ornithoptera and its subgenus. The ♀ differs only in the relative lengths of the branches and the position of the terminal point of the upper stem, which is *below* instead of *above* the base of the first discoidal nervule. The fringe is always indicated in whitish very finely and delicately, the folds between the nervules being without the interrupted whitish sublunate spots of other forms. Secondaries, smaller in proportion to the front wings than in other Ornithoptera; discoidal cell narrow, but not so proportionally long as in upper wings; all the veins very straight and long, the nervures not robust; the subcostal nervure shorter than in Pompeoptera or Ætheoptera; without any light lunate spots or lines between the ends of the nervules; the fringe merely a delicate whitish thin line as in the upper wings. Abdominal fold half the length of the inner margin, broader than in the other Ornithoptera; closed, and containing a brownish-white cottony or hairy material, closely packed. Head and eyes bolder and slightly larger relatively than in other subgenera; villose covering of the palpi projecting to a slightly greater length also; the pronotal red collar more than twice as broad as usual, and divided by a fine line of black at its nearest to the head, the lower division being four times the width of the other. The thorax stout, densely clothed with velvety black hairs, the outlines of the tegulæ invisible; underside with two oblique bands following the lines of the femoræ, and reaching from the trochanters to the base of the wings, and a tuft of red at the base of the abdomen; abdomen also silky bluish or greenish black in both sexes; anal valves small, almost circular, densely clothed with minute scales on dead brownish black, which extend beyond and clothe all the space of three or four of the subdorsal segments. Antennæ straighter or a little less robust than in other groups. Legs, with tarsi of second and third pairs longer than first, and tibia of first pair shortest; the spur at the end of the tibiæ less prominent than in Ornithoptera or Pompeoptera; the spur on the middle of the first tibia not so long as in Ætheoptera; the ungues the same as in other groups.

♀. Little or no difference except that the width of the pronotal collar is less than in the ♂, and that the interno-median nervule on upper wing, is not *quite* so long, and is more upright, and that the precostal nervure has also a very slightly different position and form. The pronotal collar however in the *var. Eleanor*, Walker is as broad as in the ♂, and of the same shape.

Type of the ~~sub~~genus. *O. Brookeana.*

TROGONOPTERA BROOKEANA.

Ornithoptera Brookiana, Wallace, Proc. Ent. Soc. Ser. 2, vol. iii., p. 104 (1855).
O. Brookeana, Hewitson, Exot. Butt. i., *Orn. and Pap.*, t. i. f. 1. (1855.
Papilio Trogon, Vollenhoven, Tijdschrift voor Ent. iii., p. 69, t. 6 (1860).
Ornithoptera Brookeana, Wallace, Trans. Linn. Soc., vol. xxv. p. 40 (1866).
Papilio Brookeana, W. F. Kirby, Syn. Cat. Diur. Lep., p. 520 (1871).
Orn. Brookeana, Snellen, Lep. v., Midd. Sum., p. 24, n. 1 (1880).
Orn. Brookeana, ♀ P. H. Gosse, Entomologist vol. vii., p. 156 (1881).
„ „ P. H. Gosse, Trans. Linn. Soc., 2nd Ser., vol. ii., p. 291 (1883).
„ „ Distant, Rhopalocera Malayana, Text., vol. i., p. 330, Pls. xxvii. A f 4 ♀; xxvii. B. f. 1 ♂, vol. ii.
Orn. Brookiana, ♀ var. *Eleanor*, Dr. F. A. Walker, Trans. Ent. Soc. Lond., pt. i., March, 1889, p. 75.

This noble insect was first discovered by Wallace in the neighbourhood of the Simunjon Coal works, near Sarawak in Borneo, and afterwards found to be fairly common in the island of Sumatra. The ♀ was unknown for a considerable period after, and still remains comparatively rare in our collections, for reasons which may be given later on. The rule that the ♀♀ should be larger, differently shaped, and be adorned with little or none of the wonderful colouring of the ♂♂ of the Ornithoptera, is here entirely departed from; in *Priamoptera* the ♀♀ are all larger than their lords, their form differs as much as if they belonged to a different family of butterflies, while their colouring is generally as sober in tone as that of many female humming-birds; in *Pompeoptera* there is a closer similarity in form, if not in size, and in colouring with the ♂♂, but no one would mistake them as belonging to any other genus; in *Ætheoptera* the contrast between the sexes appears to have attained its maximum: for while the ♀♀ are richer in their colouring than those of the first mentioned groups, they are nevertheless completely thrown into the shade by their male companions—the latter being certainly the most gorgeously coloured butterflies which have yet been seen, though they are of very moderate size, while their ♀♀ are perfect giants—suggesting the idea of huge moths rather than butterflies. But in *Trogonoptera* the ♀♀ are very nearly as splendid as the ♂♂, and their form and size differ very little if any in a series of each.

The name which the Dutch desired to give this insect would have been most appropriate, since it would be impossible for anyone who had seen the wonderful Mexican Trogon bird *Pharomacrus resplendens* (Gould) to fail in noticing the extraordinary resemblance of the markings and colour of the wings with some of the feathers of that bird. As Wallace ("Malay Archipelago," vol. i., pp. 58, 59) observes, "This beautiful creature has very long and pointed wings, almost resembling a Sphinx moth in shape. It is deep velvety black, with a curved band of spots of a brilliant metallic green colour, extending across the wings from tip to tip, each spot being shaped exactly like a small triangular feather, and having very much the effect of the wing-coverts of the Mexican Trogon* laid on black velvet. The only other marks are a broad neck-cloth of vivid crimson, and a few delicate white touches on the outer margin of the hind wings." But Mr. Wallace's name, in honour of Rajah Brooke, has been generally accepted; and will always probably be the one by which it will be known. Although the most splendid species of the Trogonidæ are found in the New World, it is not impossible that in some past time some islands of the Malay Archipelago were inhabited by a species of the subfamily *Harpactes* closely resembling in appearance the Mexican form, and living in company with this Ornithoptera which had grown to resemble it for a protective purpose—the species of butterfly surviving the species of bird. However that may be the resemblance is, to say the least, very remarkable, especially if we find the habits of the two forms in any way similar. The first description of the ♂ was written by Wallace in Proc. Ent. Soc. Vol. iii, (1855). The second was by Hewitson in the same year, the type of which is in his collection now deposited in the British Museum. For this latter reason I quote Mr. Hewitson's description:—

"♂. Upper side black, with a broad longitudinal band of golden green from near the apex of anterior wing to the inner margin of posterior wing. On anterior wing, below the middle, divided into 7 hastate spots pointing to the outer margin which they nearly touch. On the posterior wing at the middle, divided by the nervures, which are black. Abdominal margin with a fold, as in some of the Papilios. Under side black; anterior wing with line of blue at base of costal nervure; a longitudinal band just below the median nervure, and composed of four spots, the first commencing at the base blue and ending green, followed (one between each of the median nervules) by 3 large sagittiform spots pointing upwards. Posterior wing with a ray of blue just below the costal nervure near its base, and a line of grey triangular or diamond-formed spots (the latter divided by the nervures), nearly parallel to the outer margin. Each wing with a crimson spot at the base, the body belted twice with crimson. Abdominal fold larger than in most Papilios, when unfolded half-an-inch across."

The ♀ was first described by the late Philip H. Gosse in the Entomologist for 1881, vol. xiv., page 104; and as the type is in his collection it will be best if I quote his description:—

♀. "Expanse (the upper wings being horizontal and straight) exactly 7½ inches (188 mm.), my largest ♂ being 7 inches."

[This is evidently an abnormally large ♀, being 18 mm. larger than one in Dr. Fickert's collection; and 14 mm. larger than the var. in that of Dr. Francis Walker.]

"— Form of wings as in ♂—the black less pure; inclined to smoke-brown; above, forewings as in the ♂, save that the triangular feather-like spots of metallic green

*One of the Trogonidæ a family of Insessorial Birds inhabiting the old and new worlds, but especially the latter.

are on the submedian nervure, the 3rd median nervule, and on the posterior side of the 2nd discoidal: but on the anterior side of this last and on both sides of the subcostal the feathers are white, reaching far up towards the cell, and becoming impure towards the points; on the hind wings the central green patch scarcely extends beyond the subcostal, and is further contracted by all the nervules being widely black-bordered; within the cell it gradually becomes of that lustrous blue which marks the underside, and this then gives place to the oblique edge of a triangular patch of deep velvet black that reaches to the thorax; each of the nervures and nervules is bordered by a spot exactly corresponding to those on the under surface of the ♂, only instead of being clear white, of a dingy white brown; beneath—the forewings differ little from those of the ♂, save that the white submarginal borderings of the nerves are much larger, especially towards the tip, where they exceed in size those of the upper surface; hind wings exactly as in ♂, save that the fine blue at the base of the costal is much reduced."

"Head, thorax, and abdomen as in the ♂, save that the crimson of the prothorax is much suffused with black." Hab. Perak.

To these descriptions I may add the following amplifications:—

♂. Thorax above velvety black; red pronotal collar of prothorax a rich dark carmine, nearly 4 mm. wide from the head, separated at its nearest to the head by a thin line of black, like a fine streak in the upper part of the collar, and thickest in the middle. The form of this red band is as nearly as possible thus:—

Eyes red brown. Thorax, beneath:—meso- and metathorax with an oblique band or bar of rich crimson, each following the line of the respective femoræ of the legs; a small spot or tuft of red at the base of the abdomen, on each side—the sides of pronotal red collar also extending to within nearly 2 mm. of the haustellum; the red bands extend over the base of the posterior wings. Abdomen of a nearly uniform greenish-bluish silky black, the anal valves beneath of the same colour as are the eyes. The abdominal fold is larger than in most species of Papilios or Ornithoptera; is about 4 mm. wide, and nearly 19 mm. long, and if unfolded would measure nearly 13 mm. across. Unlike the folds of the other subgenera, it is also of the same brilliant green as on the middle of the secondaries; it is raised above the general level of the wing, and flattened on the surface. The fringe of all the wings is of a fuscous white, more sharply defined on the underside, so as effectively to relieve the marginal black border of the secondary wings. The neuration is not so robust as in other groups, especially on the Secondaries, but is more graceful and prolonged. The discoidal cell of the Primaries occupies considerably more than half the length of the wings—of the posterior wings very narrow by comparison with other species. The underside of the abdominal fold is silky ruddy brown, or the colour of the eyes. Length of the costa of Primaries in the first 84 mm.; width of wing 40 mm.; length of Secondaries 42 mm.; width 35 mm.; of abdomen and antennæ 33, and of thorax with head 21 mm.; of

Legs	1st pair—femora	11;	tibia	8;	tarsi	13 mm.
	2nd ,, ,,	13;	,,	11;	,,	17 mm.
	3rd ,, ,,	8;	,,	10;	,,	18 mm.

The 2 ♂♂ in the Hewitson collection measure 80 and 82 mm. respectively; these are not so large as many of the specimens which have since been brought home (probably from Sumatra), and are more blunt or rounded at the apex of the wings than the majority of specimens: indeed there appears to be two types of forewing, the one more straight and short at the costa and anterior angle, the other more rounded at the same point; in the latter the hastate markings often extend nearly to the edge of the posterior margin.

Articulations of antennæ 46 to 58.

♀. The red collar not so wide in the normal form as in the ♂—not more than 2-3rds, and of a slightly different form—the black divisional line being rather broader also, and a part of the red of the underside of prothorax appearing on each side. The lateral red marks occupy more of the space above and on each side of the legs, the base of the abdomen being nearly the same colour as that of the ♂, though, if anything with more brown in it. At the base of the wings is a small blue spot; and the median, submedian, and internal nervures are often outlined in vivid blue, as in some examples of the ♂. Length of the costa 77 (in fig.); width of wing 40 mm.; length of secondaries 40, width 32 mm.; length of abdomen 26 mm. (the original of my figures has lost its antennæ); of thorax and head 20 mm.; of

Legs	1st pair—femora	9;	tibia	9;	tarsi	9 mm.
	2nd ,, ,,	10;	,,	11;	,,	13 mm.
	3rd ,, ,,	8;	,,	9;	,,	14 mm.

♂♂. In the collection of Mr. H. Grose-Smith, with the hastate or plumose markings nearly or quite reaching the posterior margin in some specimens.

♀. With the sub-apical grey-white patch of Primaries very distinct; still more so on the underside. No blue within the cell from the base or below it. Hab. Borneo.

General Habitats:—

♂. Borneo (Sarawak) *Wallace;* Saudakan; Banjermasin, coll., *Distant;* mountains of S. Sumatra ♂ and ♀ Perak *(Künstler)*, coll. of Gosse; Malacca, *(Biggs)* in coll. of *Distant;* Johore, Sumatra, *(Snellen):* in Leyden Museum.

The ♀ is very difficult to find or to obtain, the proportion having been as small as 15 ♀♀ to 1000 ♂♂. According to Distant, *(Rhopalocera Malayana*, vol. i., p. 330,) Herr Künstler collected in Perak in 5 years over 1000 ♂♂ and 15 ♀♀ in 5 years, or an average of 200 ♂♂ and 3 ♀♀ per annum! On some days 15 to 20 ♂♂ were captured, on others none were seen. In the Kinta district they were to be found nearly all the year round, but principally in March, April, May, and June, in showery weather, flying over the muddy streams (coming from the mines) with overhanging jungle. They generally resort to spots where there is decayed animal matter. In 3 months he obtained 800 ♂♂ and no ♀♀; and during that period he only saw 20 or 30 of the latter flying high, and

settling exclusively on flowers on high trees. The bait which attracted the ♂♂ was ignored by the ♀♀. They flew by themselves, and seldom came near the ♂♂ except when the latter were in pursuit of them.

The individuals of the species seem to be most abundant by rivers, or in sunny places by the dry beds of of springs, being in largest numbers during the cool wet monsoon; so we are informed by Burbridge, who is speaking of Borneo.

In an interesting paper by Mr. S. B. J. Skertchly (contained in the Annals and Mag. Nat. Hist., Vol. IV., 6th Series, p. 210). "On the Habits of certain Bornean Butterflies," he tells us that "in the eastern part of North Borneo, which is practically an unbroken virgin forest, intersected by innumerable creeks and small streams, and some fine rivers . . . . among the many species which delight in the sunshine or the shady forest edges, forest paths, or clearings, where the light is stronger than in the forest depths, and when sunshine is close at hand, are *Ornithoptera* and *Hestiæ*. These occasionally make excursions into the jungle, but their haunts are by the river sides. *O. Brookiana* is a rare butterfly in this part of Borneo; but I have seen it in several parts of the Darval Bay Peninsula . . . . In the mountain region of the headwaters of the River Segama I saw a pair hovering above an orange-blossomed tree, and watched them courting for 20 minutes. The ♂ was sipping the flowers, vibrating its wings rapidly like a hawkmoth, the vivid green markings flashing out as the sun played on them. Then the ♀ sailed down with stately flight, showing her white spots clearly, and commenced to woo. For a long time they circled over us about 6 inches apart, the ♀ always uppermost and a little behind, so that she could see the emerald feathers of her mate. She did all the wooing. The flight was a sailing motion with a peculiar tremor of the wings, very unlike the quivering while feeding. The ♀ during the whole time pointed her abdomen downwards. A solitary *O. flavicollis* was about, and made several feeble attacks on the lovers, which they totally ignored. At length they settled high up in the tree, and united, the ♀ still uppermost."

In the same article Skertchly says that the ♀♀ of *Hestia lynceus*, *H. lenconöe*, *v, labuana*, also *Ideopsis daos* woo the ♂♂. Very likely this exception to the ordinary rule may yet be found more often to obtain than has hitherto been suspected. Years ago, in New Granada, I saw evidences that the ♀ of the beautiful little *Eubagis postverta* was the first to do the seeking; for by holding a very fresh ♂ in my hand I found it quite easy to capture the ♀♀, several of which would be hovering over me, to my great astonishment!

T. Brookeana ♀ var. *Eleanor*, (Fr. Walker) Trans. Ent. Soc. Lond. Pt. I, 1889, p. 75.

This var. Dr. Walker says resembles in some particulars the ordinary ♂ type, and also has some resemblance to the ♀ type. "The 7 hastate metallic marks of the ♂ are represented in this var. by 5 nearly similar shaped patches of the same size, the 6th and 7th above being smaller, and in some lights appearing almost as streaks of green. The green patches of the hind wings are more distinctly divided by a black line than in the ♂, corresponding in this respect with the posterior wings of the ♂ described by Hewitson, as at the middle divided by the nervures, which are . . . This latter is more a female than a male character. The green colour of both wings is brighter than in the ordinary female, but not quite so vivid as in the male; indeed it is in some lights a much warmer golden green than in the normal type of either sex." [The shape of the hastate patches of the Primaries does, however, approach those of the markings in a female in the Hewitson collection.] "The greatest difference between this var. and the ordinary female consists in the total absence of the dusky pencilling near the apex of the anterior wings, and the very indistinct figuring of the row of spots of the posterior wings, which causes the ordinary female to resemble a *Diadema*. The border of this var. has only 2 small white spots on each side of the 1st subcostal nervule of posterior wing instead of 3, and the remaining 4 grey brown spots are more indistinct. The underside of Primaries with the same dusky pencillings as in the normal form, but the whitish markings of the secondary wings resemble those of the male; indeed they are fewer in number—the indications of the 2nd inner and fainter band being slighter than in the normal types of the male or female. On the underside of the Secondaries the blue markings extending from the base are of the ordinary type. On the Primaries, (underside) the blue markings predominate over those of the ordinary female; on those of the ordinary female there is rather more metallic green."

Possibly if we were able to obtain as large a number of females as of males we might meet with every intermediate variation between the markings and colours of the two sexes, just as we do in the forms of the mandibles and armatures of the sexes of some of the Lamellicorne Coleoptera—the *Copridæ* and *Lucanidæ* for example.

The specimen of this interesting and instructive variety was obtained by accident by Dr. Francis Walker: its antennæ were absent, and it is rather worn. I thought it was best to figure it just as it was set, although it may not look quite so well in the plate. I am greatly indebted to Dr. Walker for the opportunity of figuring the 2 females which enrich my plate, and who most kindly allowed me to have the use of them as long as I needed.

The figures of the ♂ are from a specimen in my own collection, one of the first two I possessed, which were liberally ceded to me some years ago by Mr. William Watkins, to whom I have much pleasure in dedicating these two drawings. The other 7 examples in my museum do not contain any differences worthy of note.

TROGONOPTERA TROJANA.

Ornithoptera Trojana, Honrath, Berliner Ent. Zeitschrift, Vol. XXXIII., p. 3 (1886).
„ **Trojana** [O. Brookiana var.?] Staüdinger, Iris II. p. 4 (♂.) (1889).
„ „ Deutsche Entomologische Zeitschrift, Band 2, p. 7, and p. 163 (1889).
„ „ „ „ „ "Lepid. der Insel Palawan."]
O. Trojana, Fickert, Ueber die Zeichn. der Gatt. Ornith. p. 764 (1889).
O. Trojana, W. Watkins, Entomologist, No. 339, Vol. 24, with coloured plate. (1891).
O. Trojana, Semper, Philipp. Tagfal. p. 263, n. 384 (1891).
Troides Trojanus, Rothschild, Novitates Zoologicæ, V. II., p. 199 (1895).
„ **Trojana,** W. F. Kirby, "Nature," Vol. 51, p. 258, col. 1 (1895).

The most northern of the groups of Islands which compose the immense Indian Archipelago, is the Philippines, a group that is situated between 5° and 20° N. lat., and 120° and 127° E. long. Between the most northern of these islands Luzon and Formosa, nearly in the same longitude, are the small Babuyanes or Batanes, and the Bashee group; the most southern Island Magindanao is connected with Borneo by the Sooloo group, running W.S.W. from the S.W. coast of this great island to Capes Unsang and Labian in Borneo. Farther north the Philippines are connected with Borneo by a chain of islands and rocky islets extending north-north-east and south-south-west between the Island of Mindoro (of the Philippines) and Capes Inaruntang and Sampanmangio in Borneo. This chain is the Palawan or Paragoa islands, sometimes called the Archipelago of Felicia. These islands separate the Mindoro from the China Seas, which are connected by Mindoro Strait. Both seas wash the western shores of this group. Palawan or Paragoa is the largest island—for the rest of the group are only mere islets. The whole group is comprised within lat. 8° 37′ to 11° 30′ N., and long. 117° to 120° E. They had a population of 90,000 in 1887.

The climate of the Philippines is equable, the thermometer varying from 66° to 84° fahr.; they are generally well wooded, and the rainfall is very heavy.

The Philippines are exceedingly rich in insects of all orders, shells, both land and marine, and birds. And although they were carefully explored by that distinguished Conchologist, the late Mr. Hugh Cuming, especially for shells, insects, and birds, and by whose labours the shell fauna alone was brought up to 2,500 species of marine and 451 species of land and freshwater shells, of the marine Mr. Cuming estimated that at least 1,000 additional species would yet be discovered. Since then other great collectors have been continually adding to our knowledge of the richness of these islands; and probably a great deal of new and important work yet remains to be done, if we are even to arrive at an approximate idea of the full glory of the Philippine fauna. Almost the most wonderful of all the Ornithoptera, *P. Magellanus*, of Felder, is an inhabitant of this group. But it is in the island of Palawan we must look for that splendid rival of the Bornean and Sumatran *T. Brookeana*, that is to say *T. Trojana*, the species now to be described, which may or may not ultimately be found to be simply a highly specialised local form of the former species, as it is yet quite possible that in some other localities intermediate and other specialised forms of Ornithoptera may yet be found in some of these islands, or in the neighbouring islets when they have been more exhaustively explored.

♂. Primaries: Very velvety black; neuration obscurely seen; the median nervure near the base is blue; with a series of 7 submarginal leaf-like marks of shot green and blue, the terminals of the nervules passing through them like the midrib of a leaf; seen opposite the light these are golden green: obliquely against the light, emerald blue, with a tinge of purple, according to the position at which the wing is moved—one half of each mark, generally the lower half, being most strongly blue; very obliquely, violet and green; in other positions the leaf-like markings are blue on the right wing, and golden or silvery green on the left. All the marks are at their base dotted with emerald atoms; all the markings are widely separated—somewhat graduated in size, the lowest being nearly twice the size of the highest.

Under surface. Wings a warmer and softer velvety black, shading outwardly to a bluish-grey black on the right wing, and a purplish ruddy-black on the left wing, when slightly changed in position; at the inner margin with an opalescent and purplish sheen; the veins are fairly well accentuated, though their branches are very delicately constructed; there are 7 elongate lenticular silvery bluish-green marks, arranged in pairs on the disc, the lower pair almost united at the base, the others separated mostly at their apices, the wing-fold dividing them: the top one is single, and they are all composed chiefly of sapphire or emerald atoms; a rich ultramarine blue mark, subdued and modified by black and silvery-green atoms, is situated between the 3rd median nervule and the submedian fold, and extends from the base nearly 2-3rds to the outer margin, being indented at its termination; a streak of deep ultramarine blue between the costa and costal nervure, extending from the base to a little more than 1-3rd of the costal length.

Secondaries. Velvety black, with a faint bluish-green sheen towards the outer margin, and a purplish sheen within the costal nervure; a broad green discal band, subject to the same beautiful variations of colour as are the marks of the upper wing; this band is divided rather broadly, or indented by the discal black and the black veins, at the outer marginal portions: also irregularly curved and graduated into the discal black by golden-blue atoms, and towards the cell incurved, and graduated by atoms of silvery blue-green. The slightest alteration of light or position changes these glowing marks of colour so that those on the right wing will be of a silvery olive, or almost lost in a deep olive black shade, while those on the left wing will assume a proportionately brilliant warm colour; the discoidal cell is a very rich ultramarine blue—most intense on the veins,—and modified by black atoms, but in *some* positions the blue is not visible at all—while in others (viewed obliquely in a side light) it is very brilliant,

and united to the band by green-blue silvery atoms along the nervures; the base is darkest; between the median and submedian nervures (in reality on the upper part of the abdominal pouch) is a brilliant silvery ultramarine blue, greenish towards the base, and modified midway by black atoms. Indeed the colours all over the insect are remarkably like those of the richest humming-birds, and are modified in a similar manner. The chief veins are well expressed.

Under surface of Secondaries: Warm purplish velvety-black; with an extensive mark composed of silver blue atoms between the costal and median veins, most dense and brilliant towards the base—a similar spot almost filling the precostal cell; an elongate congeries of blue atoms between the 1st and 2nd subcostal branches, and a rather obscure and narrow elongate congeries within the basal part of the cell; a submarginal row of 4 or 5 very small cuneiform spots, divided by the nervules, runs parallel to the hind margin: these are reddish white. The black of the hind margin of the wing is subdued by a whitish gloss; the crimson scales of the thorax encroach prominently on to the base of the wing.

Thorax: With a broad crimson pronotal collar; the thorax below the neck is of a deep pilose velvety-black.

Head: Eyes castaneous and large; the tuft between the eyes is black and prominent; antennæ very black, and straight.

Underside of thorax: the legs are all stout and intensely black: the femora almost entirely concealed in the black and crimson scales, which also encroach slightly on the 1st articulation of the abdomen; the legs are reddish black; the spirotromp reddish black.

Abdomen, above and below, a silky-greenish black; abdominal fringe long, curved, and black.

The abdominal pouch or fold, produced as it is by a long, nearly lenticular continuation of the abdominal margin, folded over away from the body, lies *very* close to the under part of the wing—so close indeed that it is difficult even to insert a needle, if the specimen be a new one, and the reddish ochraceous *androconia* are packed far away in the pouch; the abdominal fringe is greyish-black, and fairly long. [See Pl. 27, fig. 4.] The under surface of the fold is velvety black, with the fringe looking very silky. [Pl. 27, fig. 5.]

The pseudoneura in the primary cell are very obscure; but they closely resemble that of *T. Brookeana*.

Expanse of costa, 95 mms.: width of primary wings, 45 mms.; length of secondary wings, 45 mms.; width, 35 mms.; length of outer margin, 73 mms.

Length of abdomen, 32 mms.; of thorax with head, 27 mms.; of antennæ, 37 mms. Articulations of antennæ, 54 in number.

Hab. Palawan, Philippine Islands, situated about 100 miles from the North Coast of Borneo.

In the museums of Mr. H. Grose-Smith, the Hon. Walter Rothschild, Mr. George Semper, Herr Honrath, &c.

A comparison of this species with *T. Brookeana* furnished several important differences, sufficient to entitle it to a separate specific rank—that is, as species are made; though perhaps we may readily regard it as only a local form of the former.

1st. The insect is larger and altogether more massive in appearance than *T. Brookeana*.

2nd. The beautiful green hastate marks are relatively shorter and broader, and more leaflike.

3rd. They are broadly separated from each other, while in *Brookeana* these are near each other; and the two lower ones actually coalesce.

4th. On the secondary wings there is only a moderately narrow discal green band, while in *Brookeana* the green occupies all the centre of the wing, leaving a broad submarginal black band, and only a narrow area of basal black.

5th. The abdominal fold is violet-green and black—the black prevailing; in *Brookeana* it is entirely green.

6th. The abdomen is longer relatively than that of *Brookeana*, and more slender; while the red pronotal collar is broader and not divided into two parts as in *Brookeana*.

7th. The abdominal fringe is denser than in *Brookeana*.

8th. On the underside of the wings, the green discal marks of the primaries are more slender, and the pairs are not united as in *Brookeana*, they are also shorter; in the latter also are 2 vein-divided white submarginal spots, but these are absent from *T. Trojana*.

9th. On the secondaries the submarginal vein-divided white spots are small, and do not form an entire band parallel to the margin of the wing, but in *Brookeana* they do this, are larger and more conspicuous, and are flanked with an inner series of white hastate discal marks.

10th. The antennæ are longer than the abdomen; in *Brookeana* they are the same length.

This splendid species was first sent to Herr Honrath by Dr. Platen, who at an early period discovered and sent to Dr. Staüdinger the interesting species of Pompeoptera *P. Plateni*, Staüdinger, which seems so remarkably like a transitional form towards *P. Doherty*, Rippon, and *P. Iris*, Röbur.

The ♀ of this species has yet to be discovered; but it will probably resemble that of *T. Brookeana*.

TROGONOPTERA TROJANA.

O. Trojana, Honrath, Berliner Ent. Zeitschrift, Vol. XXXIII., p. 3, 1886.

Since the publication of pages 5 and 6 of this volume, and of Plate 27, in which the ♂ of this species was described and figured, I have been enabled to study the ♀ of T. Trojana, by the kindness of the Hon. Walter Rothschild, the results of which I now present.

♀ Anterior wings a very warm rufous brown, allowing all the veins to be very prominently seen; the pseudoneura well expressed in the discoidal cell; the submedian and marginal folds also well accentuated; a transverse band of phylliform marks on the disc, extending from the inner margin to the 3rd subcostal branch; the first three from the lower part of the wing are large and delicately green, with whitish and bluish suffusions towards the outer-marginal ends, strongly divided by the veins, which thereby form their midrib; the first or lowest of these three is as leaf-like as those of *T. Brookeana*, but larger—situated on the submedian nervure: the 2nd and 3rd are larger and narrower, situated on the 3rd and 2nd median nervules; the 4th, 5th, and 6th are nearly confluent with each other, rather longer and broader, ochraceous, or deep creamy white on the 1st median branch, and 2nd and 1st discocellular nervules; the remainder constitute a light creamy patch extending to the 3rd submedian branch—only divided from the others by the veins: these are all slightly tinted with green or bluish green at the ends towards the discoidal cell; a little cluster of delicate light hairs is situated at the base of the submedian vein, flowing over on to the lower wing. These are so delicate as to be only seen by careful examination.

Posterior wings with a rather darker rufous brown than that of the anterior; the centre of the wings, or an area which includes the whole of the discoidal cell, and about 1-4th of the disc is violet blue, shading outwardly into blue-green, and rich golden green, subdued by dark atoms—the violet blue flowing into darker or lighter, as the insects are moved about in the light, and towards the base of the cell shading into dark blue or brown; a discal or submarginal row of diamond-shaped sordid light spots on the first five veins, and a continuous creamy-white patch crosses the subcostal nervure, and extends nearly to the anterior angle or apex; a few white atoms on the blue at the distal end of the cell; a bright greenish blue stripe is found between the 3rd median branch and the median nervure, which, in some positions, becomes entirely blue or blue green the whole length to the base of the wing—the abdominal margin is also of the same rich colouring—sometimes forming one continuous area of colour to the subcostal nervure; the outer margin of the wing is lunate, with light fringe crescents.

The anterior wing margin has no fringe crescents. Under surface of anterior wing nearly as above, except that some ray-like suffusions of violet extend along the pseudoneura of the cell: the costa is violet blue: and the space between the 3rd median branch and the submedian nervure is shot with violet blue and green from the base to one half of the disc: the leaf-like discal markings are creamy-white, and all confluent except that one on the 3rd median branch; and only a faint light half-mark represents the green leaf-like mark of the upper submedian surface, a patch of green-blue atoms are also between the rib and 3rd median branches. The veins are all well accentuated, and, as on the upper surface, shot with blue.

Posterior wing: the under surface of which is warm brown, deeper in tone towards the hind margin; with a small atomic blue spot near the precostal nervure; and another similar mark at the base of the wing; a submarginal or discal band of cream white marks, nearly continuous, strongly lunate without and almost enclosing a row of sub-orbicular darker patches within; the marginal fringe of both wings is a narrow graceful line of faint creamy white. All the wings above and below exhibit a slightly light sheen when moved about.

Head, antennæ and thorax velvety black; abdomen dark rufous brown all over, with a slight sheen of bluish white; pronotal collar broadly scarlet-crimson, as in Brookeana, with lateral red patches between all the legs.

Length of abdomen and antennæ nearly the same, or 35 mms.; of head with thorax 24 mms.; of costa approximately 94 mms.; of outer margin approximately 67 mms.; width of wing at the base 7 mms.; greatest width of posterior wing, 43 mms.; greatest length 57 mms.

Length of legs:	1st pair:	femur,	11;	tibia,	9;	tarsi,	14	mms.
	2nd ,, :	,,	12;	,,	12;	,,	19	,,
	3rd ,, :	,,	10;	,,	9;	,,	17	,,

Habitat: Palawan, Philippine Islands.

Only on the under surfaces of the wings does this species slightly resemble those of T. Brookeana ♀, whilst in no respect are they like those of the ♂ of either species; the ♀ of Trojana is also a bolder, larger, and more gracefully formed insect than either the ♂ or ♀ of Brookeana.

TROGONOPTERA BROOKEANA.

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In some examples of the ♀ of this species, the phylliform green marks of the anterior wings become in certain lights much more golden green than in the figs. on pl. 26; and portions of the posterior wings become vivid golden, with no admixture of green. The right wings may also be held in such a position as to render all the markings an ashy-silvery purplish-green.

♀ In other examples all the green markings are less broadly formed, and are entirely greenish-golden, with a faint bluish tint near the base of the posterior wings. The colour marks of the disc on the under side of the anterior wings are a vivid silky greenish gold—the lowest or submedian being ultramarine blue at the basal end; a small golden patch, shading into blue, occupies a position midway between the base and the distal end of the cell. On the underside of the posterior wings is a submedian band of blue atoms following the curves of the vein, but becoming very slight towards the anterior angle; a small group of blue atoms is also found at the base beyond the precostal nervure.

Additional localities: Sandakan, North Borneo; Malay Peninsular; also on Balabac Island, one of the Naturna group. The variety *albescens* of Rothschild, which Mr. Rothschild quotes as a sub-species, is found in Malacca.

It may be added that the ♀ ♀ from the Malay Peninsula always differ from those of other localities.

Genus POMPEOPTERA, Mihi.

♂. Primary wings subtriangulate; costa arcuate—more or less in different species of the genus; anterior angle always sufficiently distinct in boundary to prevent the graduation of its outline into the outline of the posterior margin; posterior margin generally nearly straight or slightly concave towards the middle, except in the case of *P. Dohertyi*, where it is more irregular; interior margin somewhat curved in some species, or nearly straight in others—*P. Darsius* for example; the 3rd subcostal nervule commences at a very short distance from the end of the discoidal cell, (in some species exactly at the end of the cell); the pseudoneura are generally fairly distinct on the undersurface [the 1st commences at the base and terminates just above the commencement of the 2nd subcostal nervule: the 2nd commences at the base, and runs up midway of the cell to the 2nd discocellular nervule, and passes over on to the disc (distorting it in its passage) so as to form a wing-fold, which curves in its course to the posterior margin: the 4th originates at the base of the cell and unites with the 2nd at a short distance, while at a fourth of its distance from the base the 3rd branches off—and terminates at the 3rd discocellular nervule, while the 4th ends near the origin of the 2nd median nervule]. The veins of the wing are always sufficiently stout, but are much more accentuated (*i.e.* rendered stouter and more prominent by their black edging) when passing through the grey-white adnervular rays in the species where these are present; the wings are either perfectly black without any grey-white rays, or ornamented with grey-white or creamy grey adnervular rays, which are sometimes very broad and distinct, often coalescing along the outer margin of the cell, or almost obsolete as in *P. Pompeus*, *Iris*, and *Dohertyi*; frequently also the grey area encroaches within the cell and and slightly margins it at the distal end; in *P. Amphrysus* these rays are golden or creamy-yellow, instead of grey.

The secondary wings are rounded and strongly dentate (less strongly in *P. Dohertyi*); the veins are always well pronounced, generally very robust, but very delicate and graceful in curve and outline in such species as *P. Amphrysus* and its varieties, and *P. Andromache*; the wing is always velvety-black and yellow on both surfaces, except in *P. Dohertyi*, which is entirely black, and *P. Amphrysus* which is almost entirely yellow—the amount of yellow or black varying in every species, and frequently, within definite limits, in the different individuals of a species: in one species *P. Magellanus* the yellow area on both surfaces in certain positions appears as a glorious opalescent glow of blue and emerald: in others, *P. Andromache* for example, with a delicate suffusion of emerald or pea-green: [in *P. Miranda* the black of the anterior wing is in some lights suffused with a purple glow]. The abdominal margin is concave with a submarginal fold or pouch filled with a closely-packed and enormous quantity of ochraceous downy hairs, *(Androconia)*, which, if drawn out by the needle would suffice to form a large heap on the wing. This pouch in new specimens is usually closed, or only faintly to be traced by a light line down the submedian fold; in older examples the pouch often appears somewhat open, and much of the contents has disappeared; the shape of this fold varies a little in different species, as may be seen by a reference to the Plates illustrating the different species described in this volume.

Head of moderate size; eyes always very prominent; palpi invisible; antennæ more or less arched and very gradually thickening towards the club.

Thorax moderately robust; the pronotal collar red, except in *P. Amphrysus*, when its var. *Flavicollis* departs from the normal character. In some species this red is either entirely absent, or almost concealed by the black hairs of the neck; the sides of the thorax, with a few exceptions, with red or coccineous pectoral spots or marks, varying in extent in the different species, but absent when the red collar is absent; legs long and slender, and differing little from those of Ornithoptera. Abdomen rather slender: anal valves more delicate and pointed than in Ornithoptera or Trogonoptera: often yellow, sometimes yellow and black; or yellow and brown: sometimes nearly entirely brown, and in *P. Honrathiana* entirely black; length of abdomen generally equal to the length of the antennæ.

Type of the genus, *O. Helena*, Linnæus.

♀. Anterior wings sub-triangulate; costa arcuate—the outline being only slightly curved till near the anterior angle or apex, when the curvature becomes more prominent; posterior margin nearly straight, or only slightly indented; interior margin nearly straight, but slightly curved in some species of the genus; the 3rd subcostal nervule commences at a short distance from the end of the cell, but the distance varies a little in some examples of the same species, [in *P. Amphrysus*, *Minos*, *Iris*, *Plato*, *Hippolytus*, *Cerberus*, *Vandepolli*, *Darsius*, &c., it originates *quite* at the end of the cell]; the pseudoneura are fairly distinct on both surfaces in most of the species, but in several they are very prominent and strongly accentuated, —*P. Pompeus*, *Ruficollis*, and *Nereis* for example, and their number and position are the same as in the ♂, the discoidal cell is rather more than half the length of the wing, and its width slightly varies in the different species—being a little more than 1-5th of the greatest width of the wing; the nervules are always, or nearly always, very stout, and specially strong near the base of the wing: the nervules are more delicate, but are always prominent; the adnervular grey, or grey-brown rays are generally very conspicuous in most of the species, sometimes becoming so broad as to occupy collectively a considerable area of the wing: this grey is in some species continued within the cell, either as a series of thin light borderings, or a light patch of an irregular shape occupying sometimes are much as 1-3rd of the cell: the grey rays generally margin all the veins from the submedian nervure to the 2nd subcostal branch [in *P. Amphrysus* these rays are suffused with yellow]; colour of the wings generally a more or less warm sienna-brown, or a dark brownish-black.

Secondary wings: costa generally much rounded; posterior margin dentated; abdominal margin incurved or concave; the discal area either orange-yellow or a brilliant golden-yellow—of greater or lesser extent—with a discal band of black or brown conical, or subconical, spots or marks; the yellow also occupies a part of the cell ranging from a mere blotch of yellow to sometimes nearly 2-3rds

of the cell; in *P. Dohertyi* however only a very small discal orange-yellow spot or two is present; but generally the wing is entirely immaculate; in *P. Hippolytus* the disc of the wing is one-half golden-yellow, and one-half a dusted grey, with a grey spot within the cell; the rest of the wing is always black, brown-black, or reddish dark brown—the marginal band being often very broad—and lunated within; veins always very conspicuous in the yellow.

Head of moderate size; eyes very prominent, palpi invisible; antennæ as in the ♂.

Thorax moderately robust; pronotal collar red or yellow—more or less prominent, the red sometimes either absent or concealed by the pilose covering of the prothorax; the meso- and meta-thorax always velvety-pilose black or brown; sides of the thorax with pectoral red spots or marks more or less extensive in area; abdomen long and slender, generally the same length as the antennæ, and brown and yellow, brown and grey, or,—in the case of *P. Hippolytus*, quite grey, with lateral black dots and ventral dark marks; anal tuft generally very dark—in *P. Hippolytus* it is orange; the abdomen in *P. Honrathiana* is entirely brown-black.

Legs as in the ♂, or differing very little.

Type of the genus *Ornithoptera Helena*, Linnæus.

Among the numerous forms included in this genus, *P. Hippolytus* differs so greatly from all the other species in its pattern and style of colour, whether as regards the wings or body of either sex, as to leave no doubt that it merits a position quite unique among its congeners. Many of the so-called species may be accepted with a doubt; but *Hippolytus* is certainly a more independent and satisfactory species than even *P. Vandepolli* or *P. Miranda*, though so much may be said in their favour.

POMPEOPTERA HIPPOLYTUS.

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Boisduval's descriptions of this species, ♂ and ♀, are as follow:—

"*Taille et port de* priamus. *Ailes supérieures noires à reflet verdâtre, offrant de part et d'autre, de chaque côté des nervures secondaires, des raies d'un grisâtre. Les inférieures d'un noir grisâtre en dessus, d'un blanc luisant en dessous, ayant de part et d'autre, une bordure noire, sinuée devisée par sept taches irrégulières d'un jaune d'or, dominant beaucoup de grandeur en approchant du bord abdominal. Thorax, antennes et poitrine noires et sans taches. Abdomen d'un jaune pâle en dessous, d'un jaune vif en dessus, avec des taches noires plus ou moins grandes.*

La ♀ differe du ♂ en ce que ses ailes inférieures ont le bord abdominal largement blanc de part et d'autre, avec les taches jaunes, cunéiformes, beaucoup plus grandes, marquées chacune d'une tache ovale noire, excepté la plus external., (Sp. Gen. I. p. 176).

♂. Form and general appearance of *priamus*. Upper wings black, with greenish reflections, shewn in each side of the secondary nervules. The rays (enclosing the nervules) whitish grey. Lower wings very dark grey above, and glittering (pearly) white beneath, having on each side a black border, sinuous, divided by seven golden yellow spots, diminishing greatly in size as they approach the abdominal edge. Thorax, antennæ and breast black, and without spots. Abdomen of a pale yellow beneath, and bright yellow above, with the black spots more or less large.

♀. differs from the ♂ in that the hind wings to the abdominal edge are largely white on each side, with the yellow spots wedge-shaped, much larger, each marked with an oval black spot, except the outermost, *i.e.*, the two nearest the anterior margin.

To this description the following additions should be made: in the ♀ superior wings, the grey-white rays extend nearly half-way within the discoidal cell, enclosing the peculiar club-shaped black markings, and the black pseudoneura; faint hind-marginal lines close to the edge, divided by the nervures. The same on the under surface, except when the club-shaped markings coalesce, as they do in some examples; inferior wings, a black spot between the third median and sub-median nervures, very pale on upperside, strongly impressed on the under-side, below this is a small irregular-shaped spot of brownish-black on upperside—the under-side being quite black. In the yellow between the first and second sub-costal nervules is also an elongated black spot, appearing shorter and browner on the under-side. The scalloped edges of wings yellowish-white, except the one nearest the apex; on the under-side the yellowish-grey-white extends within the discoidal cell, subdued by a number of black atoms; and the black of upper-side without the cell is faintly indicated by grey cloudings. Abdomen greenish grey-white above, yellow beneath, with small lateral black dots, and sub-dorsal black dots with a black patch extending from each segment except the anal, where it is only slight.

Wallace (Trans. Lin. Soc.) remarks "the ♀ ♀ from the Sulla Islands differ" (from Cramer's fig.) "only in having more yellow towards the anal angle of the lower wings." To this it may be added that the amount of yellow differs greatly; in some specimens there is much yellow; others (like one in my own collection) are almost or quite without this tint in the grey. Wallace also calls attention to the fact that "These specimens figured by Cramer under the name *Hypolitus* seem to be a remarkable variety in which the ♀ has much the character of the ♂."

In a ♂ from Amboyna, in the coll. of Mr. O. Janson, the hind wings have a much richer and deeper grey-black. The same may be said of the black of his ♀.

In a ♀ from Amboyna in the coll. of Dr. F. A. Walker, under the name of *Panthous*, the Primaries are almost entirely silky black—the grey rays being scarcely visible, and of a slightly reddish tint. In a ♀ under the same name the grey of the secondaries is not suffused with yellow, but there is no other important difference. A ♂ in the same coll. has a silky semi-diaphanous grey around the grey white rays of the Primaries similar to that of the Secondaries. Another ♂ has a faint grey white spot dividing the black on the 4th segment of the abdomen. This is not generally the case with other specimens.

In a ♀ in the coll. of Mr. W. Dannatt the black of superior wings has a slight olive-green gloss; and the black spots and bands of inferior wings are an olive-black.

♂. Viewed obliquely the grey-black of the inferior wings has a leaden metallic gloss; and in some specimens a delicate dead violet gloss over all the rest of the wings except the yellow. Viewed opposite the light this changes to a warm olive-green gloss on black of upper wings, and nervules of lower. The under surface of superiors opposite the light has a slight greenish gloss, while on the under-side of inferiors the white is pearly, ranging from lustrous white to bluish grey.

♀. A specimen in Brit. Mus.: hing wind from inner margin to second median nervule and half way beyond, very grey; underside bluish-grey.

The following are the dimensions of the examples from which the plate was drawn :—

♂. Length of casta 83; of antennæ and abdomen 34; of thorax 17; of collar 3; of head 4; and of wing 48; width of upper wing 44; of lower wing 37 mm.; greatest width of abdomen 11; least width 6; of thorax 13, and of head 7 mm. (divided by the eyes into three nearly equal parts).

♀. Length of costa 95; of antennæ and abdomen 35; of thorax 19; of collar 4; of head 3; and of lower wing 63; breadth of upper wing 51; of lower wing 63 mm.; greatest breadth of abdomen 6; least 5; of thorax 10; of collar 7; and of head 8 mm. (not equally divided by the eyes).

♂. In the coll. of another friend. Length of costa 85 mm.; from Celebes. ♀. Length of costa 97mm; from Amboyna.

♂. In the Brit. Mus. Length of costa 84; and of antennæ and abdomen, 34 mm. Hab.?

♂. In Brit. Mus. Length of costa 76 mm.; articulations of antennæ 54. Hab?

♂. In the British Museum under the name of *Remus*. Length of costa 94; of antennæ and abdomen 37; of thorax 17; of collar 4; and of head 5 mm.; breadth of thorax 9; of collar 7; and of head 8 mm.; articulations of antennæ 52.

Length of
First pair of legs: femur 15; tibia 12; tarsi 15 mm.
Second ,, ,, 16; ,, 16; ,, 19 mm.
Third ,, ,, 13; ,, 15; ,, 21 mm.
From Amboyna.

♂. In Hewitson Coll. Length of costa 90 mm.; number of articulations of antennæ 50. Hab. Celebes.

♂. In Mr. O. Janson's coll. Length of costa 73; of antennæ and abdomen, 32 mm. Hab.?

♂. In Rev. Dr. F. A. Walker's Museum. Length of costa 65; of antennæ and abdomen 25: of lower wing 35; and of head and thorax 18 mm; breadth of upper wing 32: and of lower wing 26 mm; of 1st pair of legs, femur 10; tibia 8; tarsi 10 mm; 2nd pair, femur 10; tibia 11; tarsi 15 mm.; 3rd pair, femur 8; tibia 9, and tarsi 13 mm.; articulations of antennæ about 54 each. Hab. Celebes.

♂. In the same coll., under the name of *Panthous*; Length of costa 82; of antennæ and abdomen 33; of lower wing 25 mm.; width of upper wing 43, and of lower wing 36 mm. Hab. Amboyna.

♂. In the same coll. Length of costa 92; of lower wing 54; of antennæ and abdomen 33; and of head and thorax 27 mm.; width of upper wing 47; and of lower wing 38 mm. Hab. Celebes.

♀. In Brit. Mus. Length of costa 99 mm. Hab? ♀. In Brit. Mus. Length of costa 93; length of antennæ and abdomen, 33 mm.; number of articulations to antennæ 58. Hab.? ♀. In Brit. Mus. Length of costa 70 mms.; number of articulations in antennæ 52. Hab.?

♀. In Hewitson coll. Length of costa 87; length of antennæ and abdomen 32 mm.; number of articulations in antennæ 56. Hab.? ♀. In same coll. Length of costa 101; of antennæ and abdomen 37 mm.; number of articulations of antennæ 58. Hab. Ceram.

♀. In Mr. Stanley Edwards' coll. (the original of my figs.)

Length of legs (not including the trochanters:
First pair, femur, 10; tibia, 10; tarsi, 12 mm.)
Second ,, ,, 12; ,, 14; ,, 15 mm. } Hab.?
Third ,, ,, 8; ,, 16; ,, 19 mm.)

The abdominal fold of the ♂ is rather complex, beautifully formed, of a light pearly colour within, and contains a large deposit of soft and short wooly material, which, if drawn out with a needle would pile up to a considerable height above the wing, as in the case of some of the red and black species of S. and C. American Papilios. In the ♀ it is very simple, being very little more than a convex structure, with the submedian nervure running through the middle, and following very nearly the curve of the inner margin.

This species was found by Wallace in Amboyna, Ceram, Gilolo, Morty Island, Sula Island, and Celebes.

One ♂ example has been taken by Mr. Doherty in the island of Sangir, and one ♀ in Talaut; but I could see no special difference between them and the specimens quoted above. Indeed this species does not appear to me to vary much from the normal type in either sex.

I have to thank Mr. Stanley Edwards, for the kind loan of specimens from which the plate was drawn.

In the museums of the author, Messrs. Godman and Salvin, M. Oberthür of Rennes, Hon. W. Rothschild, Mr. Lambert, Exeter, and many others, in addition to the collections named above.

POMPEOPTERA HIPPOLYTUS.

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Fig. 2. Variety of the ♀, type form, with white marks at the distal end of the posterior wing-cell, and smaller ovoid black internervular wing spots. Hab. Ceram.

POMPEOPTERA HIPPOLYTUS.

IST VARIETY, OR SUB-SPECIES: *Sulaensis.*

Troides Hypolitus Sulaensis, Staudgr. Iris VII., p. 343 (1895), ♂ ♀.
" " " Rothschild, Nov. Zoologicæ, p. 202 (1895).

♂. Anterior wings silky black, shot with a greenish-blue sheen; adnervular rays ochraceous white, but much less bright than in the type form, being subdued and shaded into the black by dark atoms and reflections till their outline is nearly lost in the general black towards the outer margin. Under surface of primaries black, but rather less silky; the adnervular rays are very prominent, and form a group from the inner margin to the 4th submedian nervule, being more bluish black at the lowest and the highest situated of the series; within the cell are three ad-pseudonervular short white rays of atoms, and part of the median nervure is also margined with white.

Posterior wings: the cell and disc silky grey black, shot with opalescent tints, in green, blue and red, with a submarginal band of seven golden yellow spots, which, as in the type form, diminish in size towards the abdominal or anal angle, having on each side a black border, sinuous in outline, extending from the anal angle to the base of the costa; the abdominal fold concealing the *androconia*, very gracefully formed and prominent, also silky black, shot with opalescent tints. Under surface: The cell and disc pearly white, more tinged with yellow towards the base; the yellow submarginal band is really continuous—the inner border of black consists of three large spots from the 3rd median branch to the discocellular vein, after which the black is continuous to the base; the outer marginal black is continuous throughout the whole outline; the veins very black—the psuedoneura black, united by black atoms at their base; the abdominal margin black, irrorated by white atoms, with a dark, long fringe.

Head, antennæ and thorax velvety black, breast with no red spots; abdomen golden yellow above, more lemon-tinted beneath, with black spots on each segment more or less large—the basal and 5th segments entirely covered above with black.

Length of costa of primaries, 83 mms.; of outer margin, 62 mms.; of inner margin, 45 mms.; width of wing at base 9 mms.; width of wing of secondaries 38 mms.; greatest length 51 mms.

Length of abdomen or antennæ 32, and of thorax with head 25 mms.

Length of legs:	1st pair:	femur,	13;	tibia,	9;	tarsi,	13	mms.
	2nd " :	"	14;	"	13;	"	18	"
	3rd " :	"	11;	"	13;	"	18	"

Habit. Mangola Island, Sula Archipelago. Discovered by the late Mr. Doherty.

The differences between this variety and the type forms are so considerable that when compared side by side, they appear abundantly distinct, though not sufficiently to justify us in regarding them as more than a sub-species. The whole insect is altogether darker than the type on both surfaces, and is really a bolder, richer and more beautiful insect.

♀. Anterior wings black; the adnervular rays extend from the submedian vein to the 3rd subcostal branch, and are broader in form and size than in the type form on pl. 29 of this work; the upper ones are tinted with yellow; the white rays bordering the pseudonera in the cell are also larger and broader than in the type form. Under surface as above, the white marks being increased in size and intensity.

Posterior wings: Cell brownish black, with delicate hairs proceeding from the base—the same black is continued between the median and submedian veins, and to the abdominal margin; the yellow discal band of spots or marks commences at the costa, and is continued to the 1st median nervule—the first three of them being bordered with black on both sides, the 4th only on the outer margin, and containing black spots—the 1st very small; the 5th division of the disc has a hastate yellow spot bordered by white at its apex, followed below by an ovoid black spot immersed in an area of grey, with a yellow sinuous spot below it, followed by the black outer margin; the next division is similarly arranged, only that the black spot is larger and narrower, and the yellow less; the submarginal black border runs in a sinuous course to the anal angle, the area between the 3rd submedian branch and the submedian veins, when not black is white clouded with black spots and atoms and a little yellow—the white in a thin line continued along the submedian fold to the base. All the discal areas are more or less subdued by dark scaling. Under surface, similar to above, except that a little less than 1-3rd of the cell at the distal end is grey white, subdued by black atoms; the yellow is purer and more diffused over the lower area of the disc between the 1st and 3rd median branches; more distinctly white without from the 3rd median branch to the submedian fold, with black subovoid spots in each space—the 2nd yellow space from the costa with the spot very small, and more ovoid than above; the first yellow division, as above, contains no black spot: the outer marginal black border at from the 1st to 3rd median branches is interrupted by the white fringe lunules, with only a couple of black spots above—that in the first space being narrower than the second; cloudings of black atoms also border the 3rd median branches; a > shaped atomic white mark at the apical angle, and a short line of white

atoms on the costa from the base, are also found; the abdominal marginal border is rufous brown, with hair-like fringe.

Head, antennæ and thorax velvety black; eyes rufous brown; thorax yellow, shaded into white on the dorsum, with basal segment black, a pair of black spots in each of the segments from the 2nd to the 6th, and the usual lateral black dots; the segments below well accentuated by black.

Length of costa of anterior wing, 93 mms.; length of outer margin, 70 mms.; of inner margin, about 50 mms.; width of wing at the base, 5 mms.; greatest width of posterior wing, 45 mms.; greatest length, 61 mms.; of abdomen or antennæ, 34 mms.; of thorax with head, 28 mms.

Of legs	1st pair:	femur,	12;	tibia,	11;	tarsi,	14	mms.
	2nd ,,	,,	14;	,,	15;	,,	19	,,
	3rd ,,	,,	14;	,,	14;	,,	19	,,

This variety is also generally a darker and bolder looking insect that the ♀ of the type form. The anterior wings are more rounded at the apical angle; on the upper side the light rays are shorter and broader, and more shaded by brown atoms; the posterior wings have more yellow, and more white on them; on the under surface the corresponding white spaces of the type form are almost entirely replaced by yellow; and the abdomen is yellow instead of being bluish-white as in the type form. A considerable difference may be remarked in the form of the anterior wing cell of the ♂. Altogether considered, *Sulaensis* constitutes a very good subspecies.

Habitat, Mangoli, Sula Islands. (Doherty).

I here take this, my earliest opportunity, of expressing the great regret I felt when learning some time ago of the untimely death of Mr. Doherty, in Africa. It is due to the memory of the deceased gentlemen to say that we are all deeply indebted to him for the knowledge and possession of the many beautiful and interesting species of insects of all orders, which his enterprising energy and love, as a collector in oriental lands, brought to us. All science is benefitted by the labours of such men as he. As in the experience of many other explorers for Zoological purposes his health suffered gradual deterioration, until an attack of the terrible and mysterious disease *Beri Beri* necessitated his return for a time to his home in America, in hope of a restoration. After a considerable period of rest, he was again in England, *en route* for Africa, for a new collecting expedition; but it seemed evident to some of those who saw him that he was not in a fit state of health to venture again in a tropical climate, with its hardships and dangers; apparently he was more hopeful of his condition than his friends were, and so he started on his new enterprise, to succumb soon after his arrival in Africa. O! the pity of it! But his courage and perseverance, like that of other martyrs in the cause of science, are worthy of our fullest gratitude and admiration.

POMPEOPTERA HIPPOLYTUS.

2ND SUBSPECIES OR VARIETY, *Cellularis*, ROTHSCHILD.

Troides Hippolytus Cellularis, Rothschild, Novitates Zoologicæ, pp. 202-3.

♂ Anterior wings more rounded at the apical angle than in the other forms; black with satiny blue-green sheen; the adnervular rays subdued purplish-white shaded into the black towards the outer margin; the cell rather broader at the discal end than in the var. *Sulaensis*. Underside a more dead black; all the white rays, and the white margins in the cell more white and prominent.

Posterior wings with the cell somewhat different from that of *Sulaensis* or of the type, in form; the yellow band a lighter yellow than in *Sulaensis*, more like that of the type in outline, but not quite so extensive as in the type or *Sulaensis*; the cell and disc with the colour nearly as in *Sulaensis*. Under surface, more like the type form in pattern and colours; with yellow white atoms in the precostal cell.

Head, antennæ and thorax intense black; eyes brown; abdomen with the black marks occupying more of each segment than in the other forms, and the yellow parts on the dorsum quite an orange yellow; laterally golden yellow, and subdorsum and anal valves grey white. Abdomen 35 and antennæ 31 mms.; respectively; thorax with head 25 mms.

Anterior wing: length of costa, 84 mms.; of outer margin, about 63 mms.; of inner margin, 46 mms.; width of wing at the base, 6 mms.; greatest length of posterior wing, 50 mms.; greatest width, 40 mms.

Length of legs:	1st pair:	femur,	10;	tibia,	9;	tarsi,	12	mms.
	2nd ,,	,,	12;	,,	16;	,,	16	,,
	3rd ,,	,,	12;	,,	13;	,,	18	,,

Habitat, S. Celebes (Doherty).

♀ Anterior wing more rounded at the apical angle than in the type form; wing broader and less long than in the type form; the cell longer and narrower than in the type form; the white adnervular rays a little more conspicuous and white than in *Sulaensis*, much more so than in the type form; the rays on the discal end of the cell also more prominent than in either of the other forms; under surface differs only very slightly from the upper.

Posterior wings: the cell very different in form, and narrower than in the other forms; pattern and colours most like that of the type form, but with no yellow tinting in the white of the internervular spaces from the 1st submedian branch to the abdominal margin, but abundant scaling. Under surface like that above in pattern and colour—the white areas being tinted with greenish blue.

Head, antennæ and thorax black, eyes brown; abdomen bluish grey and white, with a slight lateral tinting of yellow; and segment rufous; subdorsum with the articulations almost entirely black.

Length of costa, 95 mms.; of outer margin, 64 mms.; of inner margin, 53 mms.; width of wing at the base, 7 mms.; greatest length of hind wing, 60 mms.; greatest width, 40 mms.

Length of thorax with head, 26 mms.; of abdomen or antennæ, 35 mms.

Length of legs:	1st pair:	11;	tibia,	9;	tarsi,	14	mms.
	2nd ,,	14;	,,	14;	,,	19	,,
	3rd ,,	12;	,,	13;	,,	20	,,

Habitat, Toli Toli, N. Celebes.

This variety merits a position probably intermediate between the type and *Sulaensis*. Its most distinct and conspicuous difference from them is certainly in the remarkable form of the posterior cell of the ♀.

Possibly several other varieties of Hippolytus will yet reach us from the other islands of the Celebesan Seas.

POMPEOPTERA HELENA.

♂ **Papilio Eques Trojanus Helena,** Clerck, "Icon. Ins." II. t. 22, f. 1 (1764).
" " " " Linn. "Mus. Lud. Ulr.," p. 199, n. 18 (1764).
" " " " Houtl., "Nat. Hist." I. 11. p. 20, n. 18 (1767).
" " " " Linn., "Sys. Nat." Edit. xii., p. 748, n. 19 (1767).
" " " " Muller, "Naturs.," v. 1, p. 571, n. 18 (1767).
" " " " Fab., Syst. Ent.," p. 449, n. 28 (1775).
" " " " Cram., "Pap. Exot." II. t, 140. A.B. (1779).
" " " " Goeze, "Ent. Beytr.," III. 1, p. 38, n. 19 (1779).

♀ **P. Oblongomaculatus,** Goeze, same work, I. p. 44, n. 22 (1779).

♂ **Papilio Eques Trojanus Helena,** Fabr. "Spec. Ins." II. p. 10, n. 39 (1781).
" " " " Jablonsky, "Naturs.," Schmett. I. p. 203, n. f. t. 3. f. 2 (1783).
" " " " Esper, "Ausl. Schmett," p. 43, t. 9, f. 2 (1786).
" " " " Fabr., "Mant. Ins." II. p. 5, n. 42 (1787).
" " " " Gmelin, "Syst. Nat.," I. 5, p. 2234, n. 19 (1790).
" " " " Fabr, "Ent. Syst.," III. 1, p. 19, n. 59 (1793).

♀ **Papilio Amphimedon,** Cram., "Pap. Exot.," III. t. 194 A (1782).
" " Hubn., "Verz. bek. Schm.," p. 88, n. 920 (1816).

♂ **Troides Helena,** "Hubn., Verz. bek. Schm.," p. 88. n. 921 (1816).

♂ ♀ **Papilio Amphimedon,** "Enc. Méth.," ix. p. 26, n. 4 ♀ (1819); also p. 27, n. 6 ♂ (same date)

♂ ♀ **Ornithoptera Amphimedon,** Boisdv., "Voy. Astrol. Lep." p. 35, t. 1. f. 1, 2 (1832).
" " Boisdv., "Spec. Gén. I. p. 177, n. 5 (1836).

♂ " **Helena,** Doubl. Hew. "Genera Diurnal Lepidoptera," t. 1, f. 2 (1846).
♂ " " Vollenhoven, "Tijdschrift. von. Ent.," III., p. 71, n. 5 (1860).
♂ " " Aurivill, "Kongl. Sv. Vet. Ak. Handl.," xix. 5, p. 22, n. 18 (1882).
♂ ♀ " " Wallace, "Proc. Ent. Soc. Lond." V. p. 23 (1860).
♂ ♀ " " Oberth, "Ét. d'Ent." iv. p. 30, n. 6 (1879).
♂ ♀ " " Ribbe, "Iris," II. p. 207, n. 3 (1890) (Aberration of the ♀), also the same work, III. p. 41 (1890), (the Larva and pupa from Ceram).
♂ ♀ " " Röber, "Tijdschr." v. Ent. xxxiv. p. 268 (1891).

♂ ♀ **Papilio Helena,** Feld., "Verh. z. bei Ges. Wien," p. 291. n. 22 (1864).
♂ ♀ " " Butler, "Cat. Diurn. Lep. descr. Fabric.," p. 234, n. 3. (1864).

♂ ♀ **Ornithoptera Helena,** Fickert, "Zool. Jahrbüchern," pp. 735, 743 (1889).
♂ ♀ " " Staüdgr. and Schatz, "Exot. Schmett." p. 5. (1888).
♂ ♀ " " { *v. Bouruensis*, Wallace. / *v. Celebensis*, " / *v. Papuensis*, " } "Trans. Linn. Soc.," XXV. pp. 38, 39 (1865).
♂ ♀ " " *v. Leda*, Staudinger, "Iris," IV. p. 74 (1891).
" " ♀ *v. Papuanus*, Oberthür, "Étud. d' Ent.," iv. p. 31, sub. n. 10 (1879) = *Melpomona*, Rippon, "Icon. Ornith.," p. 46 (1898).
" " *v. Jupiter*, Oberth., "Ét. Entom.," iv. p. 31, t. 1. n. 11., pl. 1 (1879).
" " ♂ ♀ *v. Holzi*, Pagenstecher, "Jahrb. Nassau. ver. Naturk.," p. 103, n. 3 (1890) = *rutilans* of Oberthür; also same work and author, p. 29 (1894).
" " ♀ *v. P. Pluto*, Feld. = O. Heliacon, Boisdv.
" " ♂ *v. Carolus*, Frühstorfer.

♂ ♀ **Ornithoptera Heliacon,** ab. *rutilans*, Oberth., "Et. d'Ent." iv. p. 32, sub. n. 13 (1879).
♂ ♀ **Troides Helena,** propinquns, sub sp. Rothschild, "Nov. Zoologicæ," Vol. II (1895).
Papilio Helena, W. F. Kirby, "Syn. Cat. Diurn. Lep." p. 518 (1871).
Ornithoptera Helena, W. F. Kirby, "Handb. to the Order Lepidoptera," Vol. II. p. 264 (1896).
♂ ♀ **Pompeoptera Helena,** Rippon, "Genera Insectorum" of Wytsman, Art. on the Papilionidæ, sec. Troides, p. 14 (1902).

This species was made by Hübner the type of what, at that early period in the history of the Ornithoptera, he regarded as a single Genus. Indeed until 1816 the few known species of this tribe of Lepidoptera were all included in the continually enlarging Genus Papilio—a very natural conclusion when regarded from the point of view of the neuration only; for virtually there is not much difference between the veinative system of Ornithoptera and Papilio.

Up to this period only a very small number of forms had been discovered: these consisted of *Pompeus* from Java 1719; *Priamus* from Ceram, 1719; *Hippolytus* from Ceram, 1753; *Helena* also from Ceram, 1764; *Minos* from India; *Amphrysus* from Java, 1782; the Indian analogue of Pompeus (*Cerberus*) 1800; and *Poseidon* from the Moluccas, 1815, exactly 8 species. Of these only one sex of at least 5 forms was known, so that the materials which might justify a separation from the

Genus Papilio were still too small in number; and up to a recent time many entomological authorities still called them by their earlier generic name. For the knowledge of these we were indebted chiefly to the researches of the Dutch, who were at that time practically the masters of all that part of the east, except India and Australia, and New Guinea West of 140° longitude.

It is always rather hazardous to describe a genus from the ♀ only of a new species; but in 1816 Hübner separated the ♀ of Helena from Papilio, and characterised it as the type of a new generic form, under the name of Troides Amphimedon. Later on Clerck's ♂ Helena had to be recognised as the ♂ of Amphimedon—consequently the Amphinedon ♀ had to take the name of her husband, and abandon the name given her by Cramer in 1782. But if this generic name is still to be accepted by modern entomologists, in defiance of the very large amount of new material since accumulated, we can only logically include the whole of the Ornithoptera under the designation of Troides as Mr. Rothschild has done. This, I regret, I am unable to do, for reasons given in other parts of this work; hence I retained Hübner's TROIDES as the tribal name for the whole of the genera and species of the Ornithoptera, as set forth in the Title Page and Preface to Vol. I. of this work. It might be suggested that as a compromise, my Genus Pompeoptera should be discarded with its type in favour a *Genus* Troides with Helena as the type. Probably this might have been the best arrangement at first; but it is too late now, so far as I am concerned.

But within the last few years *Helena* has greatly enlarged its boundaries, or rather increased the number of its relatives; for we have the following varieties with names given them:—

Papuensis, ♀ *Wallace*, 1865; Jupiter, ♀ *Oberthür*, 1879; Heliacon, ab. *rutilans*, *Oberthür* ♂ ♀ 1879; Leda, ♂ ♀ *Staudinger*, 1891; Papuanus, ♀ *Oberthür*, 1879; Thestius, *Staudinger* 1894; Bouruensis, *Wallace* ♂ ♀ 1894; Celebensis ♂ ♀ *Wallace*, 1895; Melpomona, ♂. *Rippon*; Carolus, ♂ *Frühstorfer* (an ab. of Papuensis) 1897. J. A. E. Goeze, in 1759, in his "Ent. Beytr" III., 1, p. 44, n. 22 described a ♂ of *Hippolytus*, as the ♀ of Helena, under the specific name of *Oblongomaculatus*. This old and quite forgotten name has been revived by some authorities, I regret to say.

The modern custom of resuscitating old or obsolete names, and substituting them for well-known and universally accepted names, has greatly complicated the study of Entomology; and I must most firmly protest against this practice, which can do no earthly good, but much harm to science. We can imagine the results if the ancient names or spelling of our English or foreign localities were re-introduced in our maps, to the exclusion of all modern and well-known names! Something like this has for some years been happening in Entomology—especially among the Lepidoptera and Coleoptera, with the result, notably among the English lepidoptera, that if one had dropped asleep over a catalogue of our English moths some 25 or 30 years ago, and only awoke in the present year, if a present day catalogue were substituted for the former document, one would be quite unable to recognise many species by their re-incarnated names, to say nothing to the genera; it would be a new case of *Rip Van Winkle*. Indeed our insect nomenolature is becoming fearfully and wonderfully new!

P. Helena, with its varieties, has a fairly wide geographical range. Its metropolis is Ceram and Amboyna so far as the type form is concerned; but its varieties and aberrations are found in E. Java, (Salayer) Macassar, Bouru, W. Sumatra and Dutch New Guinea, and Celebes—probably in other localities also.

♂ Very large size. Anterior wings entirely velvety black, with slightly warm reflections; the veins all sufficiently prominent; the 3rd and 4th subcostal branches commence at about 2 or 3 mms. from the distal end of the cell; the pseudoneura fairly traceable within the discoidal cell. Undersurface of the wing as above, but slightly lighter and browner, with nearly obsolete small groups of white adnervular scales towards the outer margin—the remnants of adnervular discal rays. Posterior wings a rich silky golden yellow, in which the stout nervules and their branches are prominently seen; the base of the discoidal cell is narrowly black; costal and subcostal areas are black, but broadly and irregularly separated by the yellow in the subcostal area; the abdominal margin from the base is black, and merges into the broad outer marginal black band, which lunate or dentate on the disc, with a width one-half the disc; the yellow area extends narrowly dentate at the 2nd median nervule nearly half-way into the black border, and the yellow area occupies narrowly half the length of the submedian area. A few fine delicate black hairs flow from the base over this yellow area. Undersurface as above, except that the dentations of the submarginal band are still more pronounced, and softened into the yellow at their apices by black scales, as is 1-3rd of the yellow submedian portion of the wing; the abdominal margin is greyish rufous; the abdominal marginal hairs are moderately long, and reddish black.

Head with black pulvilli; eyes dark nitid brown; antennæ black; pronotal collar black enclosed by 2 fine narrow red bands; thorax black pilose-velvety above—the same beneath with the usual red pectoral patches; the legs long and black; abdomen fumous brown, the sides yellow with a dorsal lighter longitudinal mark, and the articula slightly accentuated with yellow; the subdorsum yellow, with the small lateral black dots; the anal valves creamy buff.

Length of abdomen or antennæ, 31 mms.; and of thorax with the head, 20 mms.

Length of anterior wing costa, 83 mms.; of the outer margin, 62 mms.; and of the inner margin, 44 mms. Length of posterior wing 50 mms.; greatest width 32 mms. The costa is much rounded.

Length of Legs.	1st pair:	Femur,	13;	tibia,	9;	tarsi,	13 mms.
	2nd ,,	,,	14;	,,	13;	,,	16 ,,
	3rd ,,	,,	14;	,,	12;	,,	17 ,,

Habitat: Ceram, A. R. Wallace.

In the Museum of Mr. H. Grose-Smith.

♀ Anterior wings, moderately pale rufous brown; the adnervular rays and all other light marks and streaks broad, or prominent, and buff grey, uniformly subdued by brown scales—the 3rd median and submedian marks only extending part of the way towards the cell; the distal 3rd of the cell bordered and divided by similar grey marks; the light marginal lunations are also buff tinted. Undersurface of wing exactly as above, except that the brown areas are a little purer, and the light marks are much lighter than above.

Posterior wings, brown; a creamy yellow elongate area occupies nearly one-third of the cell from the distal end; followed below by an area two-fifths of the disc, bounded by the 2nd subcostal and 3rd median nervules; followed by a transverse band of 4 long brown cones, then a discal band of yellow marks, extending from the inner margin to the costa, which again emphasise the dentate apices of the broad hind marginal band; an irregular buff-yellow mark, broadest above, extends down the submedian area from half to one-fourth of the wing length from its base, and terminates with a small cuneiform mark at the anal angle. Under surface as above, except that the light marks are all pure creamy white, the discal black cones are somewhat subdued by white scales, the outer marginal band dentations are more deeply divided by white and brown scaling, and the white fringe lunations are very prominent. The submedian area has two patches of black or brown, and a long mark of dark scales above.

Head and eyes brown, a slight red ring at the pronotum; the thorax dark brown with the usual pectoral red patches; the abdomen rufous brown, with the subdorsum and sides creamy white and yellow and the articula black except the last three which have a pair of large elongate orbicles in each articulus, and lateral rows of black spots, which towards the base merge into the general black of the subdorsum; the anal segment yellow and brown.

Length of costa 97 mms., of hind margin 66 mms., of inner margin (which is nearly straight) 51 mms., greatest length of posterior wing 63, and width 39 mms. The costa is rounded, and merges into the outer margin; the length of the inner margin is about 42 mms.

In the anterior wing the 3rd subcostal branch is emitted at 3 mms. from the distal end the cell.

Length of abdomen or antennæ 34, and of the thorax with the head, 25 mms.

Length of Legs.	1st pair:	femur,	12;	tibia,	11;	tarsi,	13	mms.
	2nd ,,	,,	14;	,,	13;	,,	15	,,
	3rd ,,	,,	13;	,,	13;	,,	18	,,

Habitat, Ceram (Wallace). In the collection of Mr. H. Grose Smith.

POMPEOPTERA HELENA, *VAR. CAROLUS.*

O. Papuensis, var. *Carolus*, Frühstorfer, "Berliner Ent. Zeitschrift, v. xliii, p. 306 (1897).

♂. Smaller than the type form of Helena.

Anterior wings velvety black, but suffused with grey, subdued by dark scales, from near the apical angle, and along the outer margin broadens, so as to occupy much of the disc—the veins and folds showing prominently in this grey. Undersurface as above, except that the greater part of the disc is creamy white, shading into the black towards the cell by white scales: close to, and parallel with the basal section of the medium nervure is a stripe of grey atoms, followed by a spot of grey atoms close beneath the second section; some faint grey spots are found along the pseudoneura in the cell; and the costa is rufous grey. Posterior wings nearly normal above, with a yellow indentation into the black marginal band near the 2nd subcostal nervule.

[This latter character is always present in varieties of Helena, and may be found useful for indentification of the different forms of that species.]

Under surface as above, but all the black borders except the basal portions of the subcostal areas are more or less scaled with grey atoms—showing a tendency towards the production of a white and yellow variety. The abdomen is rufous white above, yellow beneath.

Length of costa of anterior wings 74 mms.

Hab.: Dutch N. Guinea.

Described and figured from the type, for the loan of which I am indebted to Mr. H. Grose-Smith, to whom this beautiful and very distinct form belongs.

P. HELENA, ABERRATION *GROSE-SMITHI.*

♂. Anterior wings intensely black. Undersurface as above but slightly lighter, with a short elongate grey mark parallel to the basal section of the median vein, and close to the interno-median nervule.

Posterior wings with intensely black, broad and irregular shaped bands enclosing the rich silky yellow areas of the cell and disc. The veins are very stout and black; at the distal end of the cell are three black blotches or spots of black atoms; between the 2nd subcostal nervule and the discocellular nervure is an interrupted elongate group of black spots; between the discocellular nervure and the 1st median nervule the black border indents its way close up to the 2nd discocellular nervule, especially on the left wing: all the other apices of the black marginal band are irregularly dentate, and the yellow, as a dentation, encroaches in the black at the 2nd median nervule.

The undersurface is without these black marks; the black margin is somewhat narrower than above, more equally dentate, the apices broadly subdued by the golden yellow scales.

Length of costa, 83 mms.

The abdomen somewhat like that of *Carolus*.

Habitat: New Guinea.

A beautiful variety, in which the tendency seems to be towards the formation of an entirely black pair of wings, on the upper surface.

Habitat: New Guinea.

In the museum of Mr. H. Grose-Smith.

Probably Dannat's *Irregularis*, described by him in the Entomologist for 1897, page 312, may be an aberration of Helena, allied to the above.

♂ *Var.* from Borneo. In this variety the central area of yellow, on the posterior wing, is much restricted and narrower than in the preceding forms; the yellow at the distal end of the cell is only about 1-5th of the total area; the yellow between the 2nd and 3rd median branches, and also between the 2nd subcostal branch and the discocellular vein strongly indents the black border. The two surfaces of each wing are absolutely alike. Length of costa, 82 mms.

Var. Bouruensis. The posterior wings have the adnervular rays considerably subdued by the brown scales, so that they are barely visible except towards the outer margin where they are all sufficiently grey; on the under surface they are much lighter and purer, as is the cell spot. The posterior wing pattern is closely like that of the type ♀ but arranged on a smaller scale. The undersurface differs little from the upper, except that the yellow area is much diluted with white, and that the black portions are more or less clouded with white scales, as in the v. *Carolus* ♂.

Length of costa, 94 mms.

Habitat, the Island of Bouru, situated directly West of Ceram and Amboyna.

Any number of varieties and aberrations of Helena probably may be met with.

The diagnosis of the varieties *Papuensis* and Melpomona will be found at pages 45, 46, and the figures of each on plates 45 and 46 of this volume.

A ♂ *Var.* from Celebes in the Author's Museum closely resembles Mr. Grose-Smith's *var.* from Borneo. Also ♂ ♂ from Ceram and ♀ ♀ from the same locality in the Author's possession closely resemble the type form, the length of the costa of the largest ♂ measuring 86 mms. and of the largest ♀ 94 mms.

Wallace remarks: ♀ ♀ from Ceram and Amboyna "are always sooty, with the spots and markings on the hinder wings of a dull buff-colour, even in the freshest specimens;" also that "the local form *Celebensis* ♂ has the wings a little more pointed than in the type form; the yellow patch of lower wings extending nearer to the posterior margin, and bounded towards the abdominal margin by the first branch of the median nervure; beneath having the nervures between the discoidal cell and the outer border ashy margined.

Localities additional for the type, Island of Saparua; for *Celebensis var.*, Minahasza and Salayer."

POMPEOPTERA VANDEPOLLI.

Papilio Van de Polli, Snellen, Tijdschrift v. Ent. XXXIII., p. 22, (1890).
Ornithoptera Vandepolli, Fruhstorfer, Berliner Ent. Zeitschr. XXXIX., p. 241, t. 17, f. 1, (1894).
Troides Vandepolli, Walter Rothschild, Novitates Zoologicæ, Pt. vii., [Rev. of Pap. of E. Hemisphere, exclusive of Africa,] p. 205, n. 12, (1895).

There can be no hesitation in regarding *Vandepolli* as a most satisfactory species. The ♂ is abundantly distinct from that of any other form of Pompeoptera, and though so much cannot be said of the ♀ the latter fact only tends to remind us of its cogeneric claims, while giving us the advantage of better knowing its position among the species belonging to that genus. It is exceedingly unlike its Javan relative, *P. Pompeus*; and the ♂ is very much more beautiful, in addition to its greater size in both sexes, and is a splendid example of a mountain species, having been taken at an altitude of 4000 feet. It may be said that with *P. Miranda* of Butler, from Sarawak, and *P. Magellanus* of Felder, from the Phillipines, it helps to form a triad of species as distinguished among the Pompeoptera, as *O. (Priamoptera) Cræsus, Lydius* and *Urvilliana* do among the Ornithoptera. Excellent descriptions and figures of this species are given by Snellen and by Fruhstorfer; but I may be pardoned if I present the results of a study of the examples—from which I have drawn my figures, as I thought this would be the most useful course.

♂. Anterior wings large, and subtriangulate; *slightly* wider in proportion than in *Pompeus* and its congeners; the costa very gradually arcuate, a little more curved towards the apex; posterior margin not so straight as in *Pompeus*, being more concave; interior margin more concave than in *Pompeus*; fringe lunules very delicate and unobtrusive; the 4th and 5th subcostal nervules from the end of the cell branch off at as great a distance as the 2nd does from behind the 1st discocellular nervule; [in *Pompeus* the distance of the 4th and 5th branches from the end of the cell is greater than that of the 2nd from the 1st discocellular nervule]; the 3rd subcostal nervule originates at the end of the cell. Posterior wings broader in proportion than in *Pompeus*, and more closely proportioned to the upper wings than in that species.

Anterior wings a deep velvety black, with very faint traces of the light internervular rays, which are partly indicated by a few obscurely yellow atoms bordering the 3 median nervules, the others being faintly seen through from the grey white rays of the under surface; the black is suffused in some lights by faint olive reflections, but, viewed obliquely against the light, by a slight purple gloss.

Posterior wings deep velvety black, with a slight olivine gloss when opposite the light, especially on the abdominal fold, and a slight purple gloss when viewed against the light; the disc and 3-5ths of the cell occupied by a silky golden-yellow—very golden obliquely against the light, slightly shot with a delicate pale emerald green when viewed in the ordinary way, but with a beautiful opalescent green all over when held obliquely opposite the light; the brilliancy of this yellow is intense—the veins and veinlets being very black, and stout; the yellow patch of the cell is suboval; the black border is broad and somewhat dentate, the two lower divisions are edged above with black scales, and there is a faint spot of yellow scales outside the 3rd median nervure; the black part of the cell, and the space between the median and submedian veins are furnished with a multitude of long black hairs, proceeding from near the base, and extending nearly down to the anal angle; the colour of the *androconia* a fleshy tint; the black of the apex about twice the breadth of the general black border; posterior border nearly equally and sufficiently dentated; the veins on the black areas of the wings only slightly visible.

Undersurface. Anterior wings a glossy smoky black, with a purplish submedian fold and nervure, and olivine wing reflections; the veins all appear well in relief, but the nervules are very slender; the discal grey-white rays bordering the nervules become more obsolete in character as they approach the subcostal nervules, and commence as usual on the upper side of the 1st median branch; within the discoidal cell and along the median nervure are a few white atoms also; the margins of the median and subcostal veins, and between the subcostal branches in some lights, have a greasy appearance, produced by the black scales of these parts being more sparsely scattered, so as render slightly visible the shining surface of the wing membrane.

Posterior wings as on the upper surface—the yellow and black occupying relatively the same area; but a large yellow triangular mark is outside the 3rd median vein, followed by a small patch of yellow scales; a patch of yellowish grey scales is on the black marginal dentations between the 2nd and 3rd median nervules, and a square mark of the same character is nearly divided by the black below the small yellow mark between the same nervules; a small creamy-grey curved streak of atoms at the anal angle; the abdominal margin outside the submedian vein a silky flesh-coloured brown, with a fringe of long black hairs.

Head and thorax deep black velvety pilose; eyes dark brown; the pronotal collar with the red nearly obsolete; thorax beneath with pectoral red spots, almost hidden by the black hairs of the breast; the abdomen silky black (the dorsum partly reddish brown within 3 of the segments) with yellow laterally, and the articulations accentuated by short whitish hairs; the anal valves silky dark brown; the subdorsum yellow, with the usual lateral black dots, and a double row of ventral black spots, which occupy more and more of the segments as they near the base of the abdomen.

Antennæ or abdomen 30 mms. long; thorax with the head 22 mms.

Legs	1st pair:	femur, 10? ;	tibia, 8 ;	tarsi, (?) mms.		
	2nd ,, :	,, 12 ;	,, 12 ;	,, 14	,,	
	3rd ,, :	,, 13 ;	,, 12 ;	,, 15	,,	

The anterior leg is imperfect in the specimen.

Articulations of antenna, 50.

Costa, 80; outer margin, 63; inner margin, 41 mms. Of the posterior wings, width 36 and length 50 mms.

Habitat, West Java.

♀. Anterior wings. From the base to midway light warm-brown; from thence to the hind margin dark brown; 1-4th of the discoidal cell nearest the discocellular nervule greyish white, encroaching on the darker colour by grey atoms; the usual series of grey white discal rays each divided by the nervules, and extending from the discocellular branches to near the hind margin (also in the space between the 4th and 3rd subcostal branches) as far as the 1st median branch, the one bordering the 2nd median branch at 2-5ths of its length from the median vein, and the next at 3-5ths: a thin short ray is divided by the submedian fold, and the submedian nervure broadly divides a broad ray or patch of grey at a little more than half way from the base, extending nearly to the anal angle. The fringe lunules are narrow, and almost continuous with each other from the anal to the apical angles, and are creamy white; the nervules are stout and their slender branches broadly defined by the dark brown which margins them. Posterior wings: from the base to 2-3rds of the cell, and all the subcostal dark area, a dark brown; a broad discal area of greenish yellow occupies 1-3rd of the cell, and the greater portion of the disc, becoming less ample between the 3rd median nervule and the submedian nervure as far as the abdominal margin, which is a sordid creamy or buff white, a part of the light spaces between the 2nd and 3rd median branches being of the same colour; the marginal band is broad, black and lunated, each lunation uniting with the base of the internervular black discal cone, whose apices all point towards the base of the wing, and are six in number,—the 6th, enclosed by the 3rd median branch and the submedian fold being much smaller, and uniting with a dark brown spot near the anal angle—these two latter being clouded with darker greyish macula produced by black atoms; the yellow area is rendered green by dark hairs in the discoidal cell, and darkish atoms on the disc, being most numerous and conspicuous at the base of the internervular black cones; the creamy-white fringe lunules are conspicuous and well separated from each other by the marginal dentations of the wing.

Undersurface: anterior wings, similar to the upper side except that the brown is lighter and more silky from the base, the veins and pseudoneura are well pronounced, and the light rays and marks are warmer in tone towards the hind margin. Posterior wings: the arrangements of markings and other details the same as on the upper surface, but the black cones are more sharply outlined,—are disconnected at their base from the marginal lunations,—the 6th cone is as long as any of the others, but narrower, and is united half way of its length with the black abdominal margin,—the light and discal areas are creamy white instead of yellow, as on the upper side, but slightly suffused with yellow at the base of some of the black conical marks; a greyish white subapical-shaped mark terminated with a cuneiform spot; the 3 lowest marginal lunations are divided and modified by grey atoms so as to constitute central black marks, and dentated black spots at the terminals of the nervules; there are 2 small black spots at the anal angle, and the submedian vein is margined a part of its length by creamy white; the abdominal fringe is black, and rather short. Head and thorax black; eyes dark brown; the pronotal red nearly hidden by the pilose covering, the pectoral red spots beneath are almost concealed by the pilose covering of the breast and femoræ; abdomen dark brown above, laterally light yellow; beneath, all the segments black divided by thin yellow articulations;—the usual lateral black dots are exchanged for rather large black spots; the anal segment very black.

Length of anterior costa 88 mms., width of wing 50, hind margin 66, and inner margin 49 mms.; width of posterior wing 44, length 61 mms.

Measurement of Legs.	1st pair:	femur, 12;	tibia, 10;	tarsi, (?) mms.		
	2nd ,, :	,, 13;	,, 12;	,, 21	,,	
	3rd ,, :	,, 11;	,, 12;	,, 16	,,	

Antennæ or abdomen, 30 mms.; thorax with head, 22 mms.; articulations of antennæ, 48 mms.

Hab.: West Java, at a height of 4000 feet.

The ♀ of this species is most like the same sex of *P. Darsius* of Gray, *P. Helena*, Linn., and *Minos*, Cram.

I am greatly obliged to Mr. H. Grose-Smith for the pleasure of figuring and re-describing this grand species.

♀. An example in the author's collection, while exhibiting the same pattern on both surfaces, has all the discal black conical and subconical spots of the lower wings smaller than in the above ♀, while the light yellowish area of the under surface is also considerably whiter. In addition, on the left anterior wing (only) the subcostal neuration is abnormal. [See Pl. 33, fig. A. r. & N. l.]; the 1st subcostal nervule branches off at the usual point, proceeds a little way, till at a second point approximately parallel to the end of the cell, it bifurcates into two veinlets: the 3rd, 4th, and 5th branches commence in the usual way, but the subcostal vein is slightly distorted at the spot where the 2nd branch should originate—the *hiatus* being only noticeable on a close observation; it is really as if the 1st branch were divided into 2 branchlets, the 2nd branch were absent, and the other 3 branches were in the normal position. Length of costa 76 mms.

Hab., W. Java.

♂. In the author's collection, differs little from the ♂ described above. Length of costa 70 mms.

Hab., W. Java.

POMPEOPTERA VANDEPOLLI, *var.* HONRATHIANA.

Ornithoptera Honrathiana, *Martin*, ♀, Berliner Ent. Zeitschr. XXXVII., p. 492, (1892).
,, ,, ,, ♂ ♀, Natuurk. Tijdschr. v. Ned. 2nd, LIII., 3 (Sep.), p. 1, n. 1, (1893).
,, ,, ,, ♂ ♀, Hagen, Iris VII., p. 19, n. 4, (1894).
Troides Vandepolli honrathianus, Rothschild, Novitates Zoologicæ, Vol. II., p. 205, n. 12, b. (1895).

♂. In the pattern of the wings, on both surfaces, this form differs very little from the type form; but the abdomen is entirely a deep brownish black, the anal valves being dark red brown; the abdomen is also rather hairy, and conveys the idea of T. Brookeana, *Wall.*

Hab.: Mount Battak, Sumatra.

♀. Anterior wings light brown, pattern the same as on the type form, except that the intercellular dark area terminates in 2 dentate projections at near the end of the cell in the grey area; in the type form the grey intercellular area is only traversed by the pseudoneura. This may be a means of always distinguishing the ♀ of this variety from that of the type form. Posterior wings similar on both surfaces to the type form, but the yellow internervular spaces are narrower, and the markings more slim, those bounded by the 1st median nervule and the submedian fold or sinus are margined with white, and the abdominal margin has little or no white; the abdomen is entirely brownish black and hairy, probably as a protection from mountain cold.

Hab.: Battak Country, Sumatra.

The melanism of the abdomen of both sexes in this var. is remarkable, as it is not met with in the Javan type form, which is also a high mountain region insect.

I am indebted to the great kindness of Mr. Snellen, of Rotterdam, for the loan of the examples from which my figures are drawn, and also for examples of the type form for dissection.

Examples of the two sexes of this *var.* are also in the museum of the Hon. W. Rothschild.

POMPEOPTERA HALIPHRON.

Ornithoptera Haliphron ♂, Boisduval, Spec. Gen. Lepid. I., p. 181, n. 9, (1836).
,, ,, ♂ ♀, Felder, Lepidopterologische Fragmente, p. 37, Taf. ii., f. 2, 3, (1859).
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Papilio Haliphron ♂ ♀, Felder, Verh. z. b. Ges. Wien. p. 291, n. 25, and p. 334, n. 20, (1864).
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Ornithoptera Haliphron ♂, Standinger and Schatz, Exot. Schmett. I., p. 5, t. 2, (1884).
,, ,, Ribbe, Iris III., p. 39 (larva and pupæ), (1890).
,, ,, Fickert, Ueber die Zeichn. der Gatt. Ornith. p. 734, n. 4; and p. 743, (1893).
Troides Haliphron ♂ ♀, W. Rothschild, Novitates Zoologicæ, Vol. II., p. 206, n. 13, type (*a*), (1895).
[**Ornithoptera Amphimedon** ♂*, Doubld. Westw. and Hewitson, Gen. D. L. t. 1, f. 2 (1846).
,, ,, ♂*, Gray, Cat. Lep. Ins. Brit. Mus. I., p. 5, n. 11, (1852), (as a synonym of *P. Darsius*).]

The ♂ of this graceful species is somewhat suggestive of the ♂ of *Vandepolli* and its variety *Honrathiana*, although the yellow area of the posterior wings is considerably less in extent, and with a few exceptions not occupying any part of the discoidal cell. In *Vandepolli* 3-5ths of the cell are yellow, in Haliphron when any yellow is found within the cell it is only either as a narrow yellow spot or mark at the distal end, varying from half the width to the whole width. Sometimes only a faint rudiment of this spot is present; and the two wings are nearly always asymmetrical in this particular. The adnervular rays on the anterior wings are whiter and rather more conspicuous than in *Vandepolli*; they are also rather narrower in shape. The posterior wings are suggestive of those of *Plato*—though that species is perhaps more like *Vandepolli* in some respects, and its ♀ suggests the ♀ of Haliphron. Other species or forms slightly resembling Haliphron in the male sex are Doherty's *Naias*, and Robür's *Iris* on the posterior wings—though, of course each is abundantly differentiated from Haliphron or *Vandepolli*. Nor must we omit to recall the fact that while the inferior wing patterns of *Vandepolli* and *Darsius* have much in common—there is also a less close resemblance between the latter and Haliphron. In Haliphron, *Darsius*, *Vandepolli*, and *Honrathiana*, the conical internervular discal band of black marks is always present on the wings of the females, varying in length and width, 'tis true, and generally uniting at their bases with the apices of the outer marginal lunations on the upper surfaces of the wings, but more or less separated from them on the under surfaces. The intercellular dark portions of the ♀ upper wings of *Darsius*, *Plato*, *Honrathiana*, *Plateni*, and *Dohertyi*, all terminate with a pair of more or less long dark dentations near the end of the cell, longest in Haliphron; while in *Pompeus*, *Nerias*, and *Vandepolli* (the type form) there are no dentate terminals to the intercellular dark areas; so that in these respects *Vandepolli* and *Honrathiana* take after distinct groups of anterior wing patterns—a very curious circumstance!

♂. The costa is much less arched than in *Vandepolli*, and the posterior margin much less rounded; the interior margin is only slightly curved, being nearly straight, and well exhibiting the scalene-triangular form of the wing. Colour of the wing deep velvety black, with the adnervular grey rays only very moderately seen; the whole of the discoidal cell is black, and the veins are all fairly stout. Undersurface more or less brownish black—not so velvety as above, with the pattern similar to that of the upper surface, except that the adnervular rays are whiter and more distinct, they are 8 in number, extending from the 3rd subcostal to the 3rd median branch; the distal third of the cell is also greyish white, with long central coalesced dentations, and the 4 pseudoneura fairly distinct—(the 2nd passing through the fine grey white central streak of the black dentation).

The veins are not so stout as in some species, but sufficiently distinct on both surfaces; the median nervules running through the adnervular rays are themselves as usual more strongly accentuated by being slightly bordered with black, especially on the upper surface. The posterior wings velvety black-brown, with a discal transverse broad patch of brilliant yellow, divided by four of the nervules; in some specimens a small yellow spot or blotch is found close within the distal end of the cell, generally of a different shape and size on each wing of the example: sometimes this mark is absent, and the cell is immaculate, and sometimes a moderately broad transverse mark of yellow runs parallel with the discocellular nervules within the cell—thereby forming a part of the entire yellow discal band or area of the wing. By reason of the narrowness of this yellow area the wing from the end of the cell to the base, with the whole of the inner margin, and from the 2nd median nervule, and also a very broad hind submarginal portion of the wing are velvety black; the under surface is exactly similar to that above. The black on the upper side is shot with a delicate olive-greenish sheen, and on the underside with a bluish-green sheen; the fringe lunules are whitish and very slight, being almost invisible on the anterior wings; from the posterior wings they are quite absent.

The head is black; the eyes are castaneous; the thorax pilose black, and abdomen rather a light brown. The pronotal red collar of the thorax (or neck) very distinct in some examples. The pectoral scarlet or coccineous spots are small, but extend to over the whole surface of the metathorax; the abdominal marginal fringe of hairs is moderately extensive, and the hairs black and fairly long.

Length of costa in 5 examples in the Author's Museum varies from 65 to 72 mms. Length of abdomen or an-

*These two on the authority of W. Rothschild's "Novitates Zoologicæ."

tennæ 26 mms., and of head with thorax 19 mms. Greatest width of anterior wing 35 and of posterior 27 mms.; greatest length of posterior wings 43 mms.; length of posterior margin of Primaries 50, of interior margin 38 mms.

Length of Legs { 1st pair: femur, 10; tibia, 8; tarsi, 11 mms.
2nd ,, : ,, 12; ,, 10; ,, 13 ,,
3rd ,, : ,, 10; ,, 11; ,, 14 ,,
including the trochanters.

Articulations of antennæ, 54 mms.

Habitat: Celebes.

the pseudoneura more distinct, and the subconical brown dentation almost disconnected from the brown area of the cell; all the grey adnervular rays are rather more pronounced, and there is a supplementary ray bordering the submedian nervure—and a small one on the submedian fold or sinus. Posterior wings, with a fairly extensive golden-yellow area; this yellow occupies nearly half the discoidal cell—distal end: a very small section of it also in the space between the 1st and 2nd subcostal nervules, without the cell, and the remaining yellow area encloses 4 pyriform, black marks, in some examples confluent with the broad dark submarginal border, in others slightly separated from it by the yellow: the first of these, between the 2nd and 3rd subcostal nervules is the largest, the next below is the smallest, and the remaining 2 are slightly longer;

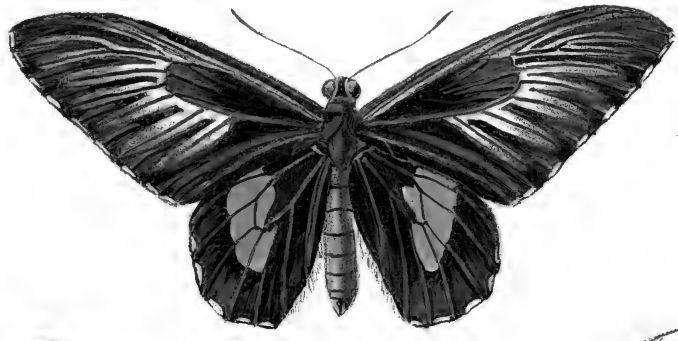


FIG. 1. POMPEOPTERA HALIPHRON, ♂.

FIG. 2. ♂ UNDERSIDE.

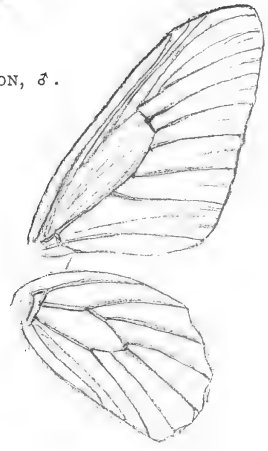


FIG. 2a. NEURATION OF THE ♂.

♀ Anterior wings warm dark brown, lightest towards the base of the wings, with about 8 adnervular grey white rays, subdued by brown scales; the veins all delicate but well expressed. Within the discoidal cell the outer half is grey-white bordering the submedian, median, and discocellular nervures, of irregular width, with a central broad dentate or subconical extension of the dark area of the rest of the cell, through which the 2nd pseudoneurus is revealed by a fine streak of grey. Undersurface of the wing similar, but the grey of the cell is broader in every detail, and the central streak of grey also broader—in all the examples I have seen these marks are very constant in shape, and graceful; a dark orange-grey mark is curved by the 3rd median branch and the submedian vein, all the remainder of the wing is dark velvety brown; the veins are dark brown and strongly expressed in the yellow.

Under surface of the Anterior wing as above, except that the dark parts of the wing are lighter, as are the light rays and light parts of the cell. Under surface of the posterior wing as above, except that the orange-yellow of the upper

surface is a creamy orange-white extending to the submedian nervure; the fine-line fringe lunules on both surfaces are orange creamy-white. Head, thorax and abdomen are dark fuscous brown; the eyes castaneous; antennæ and legs (which are long and graceful) intensely black.

Underside of thorax with the usual pectoral red mark, and of the abdomen with the articulations slightly indicated by a few yellow scales.

Habitat: Celebes, Macassar, SE. Saleyer (very common), Bantimœrong.

The var. *bauermanni*, Röber, is of no great importance, except that it comes from Kabia Island, as does Oberthür's synonym *pallens*, in addition to the other localities mentioned; but, for the purpose of comparison, I give Mr. Oberthür's description:—"*O. palleus* (an aberration —or var. ?—of *O. Haliphron*), "♀ smaller than the typical ♀, the base of the Anterior wings are of a distinct grey yellow; the white adnervular rays present more white than in the type form; the head, thorax, and abdomen are of a dark grey, slightly golden. This it is which gives to this variety its special aspect; the pronotal red collar is very strongly accentuated in the two examples which I possess." Oberthür, 'Ét. d'Ent.,' iv. p. 110 sub. n. 7 (1879).

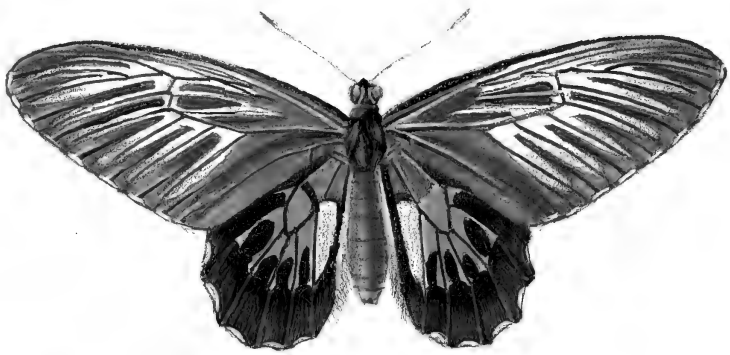


Fig. 3. Pompeoptera Haliphron, ♀.

Fig. 4. ♀ Underside.

Fig. 4*a*. Neuration of ♀.

Length of costa about 80 mms.; of outer margin 45, and inner margin about 34 mms.; width of wing about 35 mms.; greatest length of posterior wing about 47, and width about 24 mms.

Length of abdomen or antennæ 26, and of thorax with head 16 mms.

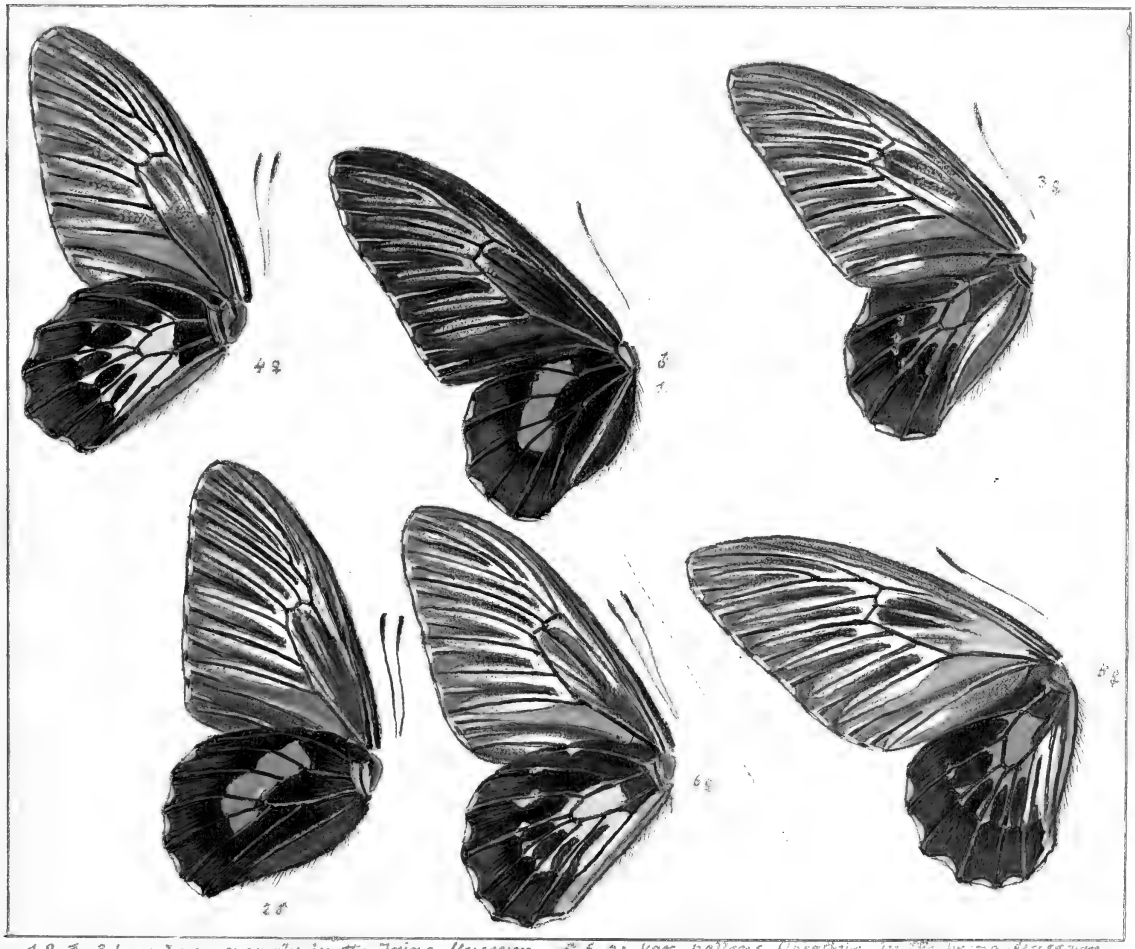
Length of Legs	1st pair:	femur, 10;	tibia, 7;	tarsi, 9 mms.
	2nd ,, :	,, 12;	,, 11;	,, 15 ,,
	3rd ,, :	,, 10;	,, 10;	,, 15 ,,

Mr. Oberthür also, in the same article, makes the following observation on 3 examples of a ♂ var. of *Haliphron* which he received from Celebes (or Kabia Island?)

"This variety differs from the type by the extension of the golden yellow discal band of the lower wing. In those sent from Celebes, which I recently received, I found three ♂ examples—in one of which the narrow yellow band did not encroach within the cell; on the contrary in the 2nd individual the yellow band occupied a small portion of the cell; and lastly the 3rd specimen is intermediate between the two others, and has two yellow dots within the cell." By which it may be seen, on referring to my description of the ♂ at the beginning of this article, that the normal character of the discal yellow band allows of a small invasion of the discoidal cell, more or less pronounced in some individuals. Other variations of the females of this species present the following features:— ♀ with very light anterior wings; the basal or abdominal margin very light brown (*v. bauermanni*); also with the anterior wings darker. Hab. Kalao, Saleyer; with yellow and black areas of hind wings more or less contracted, S. Celebes, S. Flores, Lombreu, Pantar, Adonara, Alors, Wetter.

♀ very dark; hind wing very black, yellow area very small; obsolete traces of discal spots. Hab. Wetter. This may really be a form of *Staudingeri*.

My figures are drawn from specimens in my own museum, which were kindly sent me by the late Philip H. Gosse two years before I commenced this monograph.



1. 2. ♂; 3. 4. ♀; from examples in the Tring Museum. ♂. 5. ♀; var. *pallens*, Oberthür, in the Tring Museum.

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" " Rothschild, "Iris" v., p. 442 (1892).
" " Piepers and Snellen, "Tijdschr. v. Ent." xxi., p. 37, n. 147 (1878).
" " Var. *bauermanni*, Rober "Iris" I., p. 19. ♀ nec. ♂ (1885).
" " Var. *pallens* Oberthür, "Ét. d'Ent.," iv., p. 110, sub. n. 7 (1879), is the same as *bauermanni*. ♀.
" " Var. *piston* Rothschild.

POMPEOPTERA NAIAS.

Ornithoptera Naias, Doherty, "Journal of the Asiatic Society of Bengal," p. 193, n. 116 (1891). ♂ ♀.
„ „ *Var. Sambawana*, Doherty, l.c., p. 194, sub. n., 116 (1891). ♂ ♀.
Ornithoptera Socrates, Staudinger, "Iris," iv., p. 71 (1891), id., l.c., vi., p. 83, t. i. f. i. (1893). ♂ ♀.
Troides Haliphron, v. *Naias*, Rothschild, "Novit. Zool." Vol. II., p. 207 (1895).
Pompeoptera Naias, Rippon, "Genera Insectorum" of Wytsman, Section TROIDES, p. 13 (1902).

♀. Anterior wings velvety black, with the adnervular light rays very distinct; within the cell at or near the distal end only faint white lines, which also slightly emphasize the pseudoneura; fringe lunules white, and only delicately indicated. Undersurface as above except that the light rays are more prominent, and in 2-3rds of the cell they very prominently emphasize the pseudoneura. Posterior wings: the yellow area within the cell (one-half its extent) and without on the disc is, similar in shape and extent to that of *Criton* and *Plato*; the rest of the wing is velvety black. Undersurface as above. The abdominal marginal fringe-hairs rather long.

Thorax, head and antennæ black; pronotal collar red; abdomen very dark brown, with yellow green margins, underside of thorax with the pectoral red mark, of abdomen partly black, and partly greenish yellow; anal valves black.

Length of costa 67, of outer margin 50, and inner margin 31 mms.; width of posterior wing 25 mms.; greatest lengh 37 mms.

Length of abdomen or antennæ 24 mms.; of thorax with head 24 mms.

Length of Legs { 1st pair: femur, 10; tibia, 6; tarsi, 9 mms.
2nd „ : „ 10; „ 10; „ 14 „
3rd „ : „ 10; „ 8; „ 16 „
including the trochanters.

♀. Anterior wing very dark brown; the adnervular rays well represented, subdued by brown atoms; 2-3rds of the cell also with 3 long patches of scaly-white, through which the pseudoneura pass; an adnervular white streak attached to the submedian vein; undersurface as above, except that all the light rays are whiter and more prominent, and they nearly fill the cell.

Posterior wings: 2-3rds of the cell yellow; also about 2-3rds of the disc yellow, near the submedian vein suffused with white; within the discal yellow area are 4 subconical black spots united at their base with the submarginal black; at the upper part of the wing the black of the disc occupies the 2 spaces where theoretically 2 more subconical marks should be; 2 or 3 small white streaks at and near the anal angle. Undersurface nearly as above; all the rest of the wing on both surfaces velvety-black. Head, antennæ and thorax black; eyes brown; abdomen dark brown, with the last 3 segments margined yellow. Underside of thorax with the pectoral red patch; legs black; abdomen yellow, the annulations or segments well expressed with black.

Length of legs. { 1st pair: femur, 11; tibia, 12; tarsi, 14 mms.
2nd „ „ 13; „ 13; „ 14 „
3rd „ „ 11; „ 10; „ 15 „

Hab. Sumba, where it is common. The var. *sumbawana* is taken in Sumbawa, the form called by Staudinger *Socrates* is found in Wetter, Sumbawa, Alor, and Adonara.

[Reference to these islands will be made in the article on Geographical distribution, at the end of this volume.]

POMPEOPTERA CRITON.

Ornithoptera Criton, *Felder*, "Wien. Ent. Monat. IV." p. 225, n. 72 (1860). Also p. 49 of Feld. "Entomological Fragments."
Papilo Criton, *Felder*, "Reise Nov. Lep." I., p. 12, n. 6 t. 4 a—c (1865). ♂. ♀.
Ornithoptera Criton, *Wallace*, "Trans. Linn. Soc." Vol. XXV. (1865). ♂. ♀.
„ „ *Oberthür*, "Études d'Ent." IV., p. 31, n. 10 (1879). ♂. ♀.
„ „ „ "Ann. Mus. Civ. Genova," XV., p. 468, n. 3 (1880). ♂. ♀.
„ „ *Butler*, "Annals Mag. Nat. Hist." (5), XIII., p. 196, n. 42 (1884).
„ „ *Staudinger und Schatz*, "Exot. Schmett." I., p. 5 (1884).
„ „ *Ribbe*, "Iris," III., p. 43 (1891). [Larva and pupa].
Papilio Criton, *W. F. Kirby*, "Syn. Cat. Diurn. Lep." p. 519 (1871).
Ornithoptera Criton, *Fickert*, "Ueber die Zeichnungsverhältnisse der Gatt. Orn." p. 737.
Troides Criton, *Rothschild*, "Novitates Zoologicæ," V. II., p. 210, n. 16 (a 2), type ♀ similar to ♂. (b 2) V. *Oberthüri* ♀; (c 2) V. *felderi*, ♀. (1895).

Pompeoptera Criton is properly a member of the *Haliphron* group, which also includes *P. Naias* of Doherty, *P. Iris* of Röber, *P. Plato* of Wallace, and *P Staudingeri* of Röber, at least, if not *P. Riedeli* of Kirsch, in addition to the varieties of Haliphron, as at present known.

♂ Anterior wings entirely velvety black, with slightly silky greenish reflections on their upper surface; the veins only slightly discernible. Undersurface entirely olive-greenish black; veins prominently in relief; the nervules faintly margined with lighter tones—the analogues of the light internervular rays usually present on the wing above and below, in most of the species of this Genus; the marginal wing folds accentuated by greyish atoms.

Posterior wings warm reddish lemon-yellow—with the veins prominently black; the base of the wing, and outside the precostal for a short distance, half the cell diagonally, and the area from the submedian to the abdominal pouch deep velvety-black; the whitish line indicating the inner portion of the pouch or wing-fold fairly conspicuous; the broad submarginal border black, and lunate within between the veins. Undersurface as above, but with the area of the abdominal fold reddish black, with moderately long hair fringe.

Head and eyes dark castaneous—between the eyes dark pilose black—haustellum black. Antennæ black.

Thorax above velvety black; beneath, with red collar, and red marks from the base to half way on each side of the legs.

Abdomen above brown, subdued by atoms, with lateral yellow marks on the penultimate annulations; subdorsum yellow, with the usual black dots; anal valves brownish-black.

Antennæ 22 mms. in length; abdomen 24 mms.; thorax with head 16 mms.; length of costa 57, and width 34 mms., in the anterior wing; outer margin 34 mms. Width of posterior wing 25, and length 34 mms.

Length of legs	1st pair:	femur 7;	tibia, 7;	tarsi, 9 mms.
	2nd „ :	„ 10;	„ 10;	„ 10 „
	3rd „ :	„ 9;	„ 9;	„ 12 „

The outer margin of the wing is gracefully incurved; the antennæ are most like those of the typical papilios.

Described and drawn from Felder's type.

♀ Anterior wings warm brown, with light adnervular rays, all of which, with the exception of that belonging to the 3rd median nervure, reach the boundary of the cell (the latter only half-way); two faint light rays below on the submedian fold and submedian vein: a faint light irregular area within the discoidal cell at the distal end subdued by brown atoms, as with the adnervular rays. Undersurface similar, except that all the lighter areas are broader and lighter; the veins are very prominent as are also the pseudoneura on both surfaces.

Posterior wings dark brown, with a large orange-yellow discal area; the orange tint of the yellow is produced by a powdering of reddish scales; the veins deep black. This area extends to about 1-4th within the cell, and is somewhat sinuate; within the veins is a row of 5 large suboval black spots, marked off from the outer marginal black border by white atoms. All the remainder of the wing is velvety-black—the submarginal border being lunate; the inner margin reddish-brown. Undersurface as above, except that the yellow area of the upper becomes an ochraceous or creamy-white on the under-surface, the discal black spots are smaller and more irregular in size and shape, are dotted with white atoms, are 7 in number, and the submarginal border consists of 7 accuminate

divisions nearly reaching the discal spots, and divided from each other by brown spaces; this marginal border and the inner black areas of the wing towards the base and in the cell are ornamented with white atoms. The light marginal lunations on both surfaces of all the wings are creamy-white. In the ♂ they are white and only seen on the undersurface of the wings.

Length of legs { 1st pair: femur, 9; tibia, 7; tarsi, 12 mms.
2nd ,, : ,, 10; ,, 10; ,, 15 ,,
3rd ,, : ,, 9; ,, 9; ,, 15 ,,
including the trochanters.

From Felder's type.

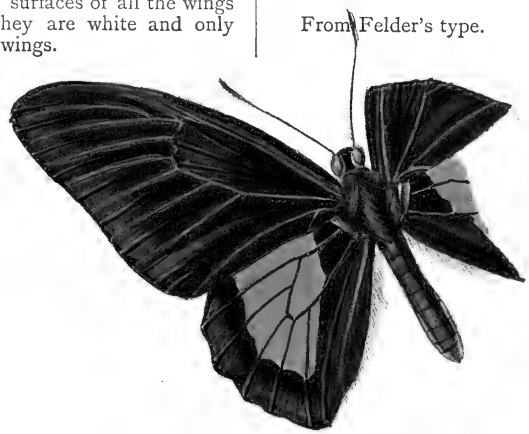

FIG. 1. POMPEOPTERA CRITON, *Felder*. ♂.

Head and thorax black; abdomen warm brown; eyes castaneous. Beneath, thorax with deep red patch halfway down the sides of the legs, and red collar; abdomen lemon-yellow, with dark atoms and lateral black dots—each articulation marked by a thin line of lemon-yellow; anal tuft reddish black.

Habitat: Batjan, Gilolo, Morty; taken by Mr. A. R. Wallace; Dodinga, Ternate, according to Oberthür, Halmahera (or Gilolo, as it is called by the natives): localities also quoted by him in the "Ann. Mus. Civ. Genova." The varieties *oberthüri* and *felderi* of Rothschild are from N. Molucca, in addition to the above localities.

FIG. 3*a*.
NEURATION OF ANT. WING.

FIG. 2. ♂ UNDERSIDE.

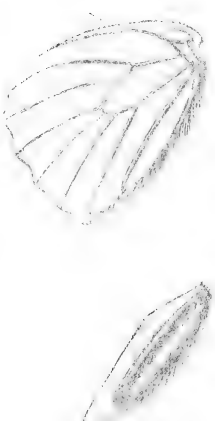

FIG. 3*b*. NEURATION OF POSTERIOR WING.
3*c*. ABDOMINAL FOLD OF THE ♂.

Length of costa of anterior wing 75, width 46 mms.; length of outer margin 55, of inner margin 40 mms.; length of posterior wing 45 mms.; width 31 mms.

Length of thorax with head 21, of abdomen 28; and antennæ 26 mms.

Batjan is a small island situate S.W. of Gilolo, or Djilolo; Morty Island is nearly at the extreme N.E. of Djilolo or (Halmahera), and is slightly larger than Batjan; Ternate lies West of Djilolo at about midway of the latter's coast; the species therefore appears to be confined to the Djilolo group of Islands, or at any rate to a limited

portion of the Northern Moluccas. A closely allied sp. if not a var. is also an inhabitant of Batjan and the Island of Oby, N.E. and by N. of the same island. The splendid *Ornithoptera Cræsus* is an inhabitant of Batjan, and its close ally *O. Lydius* with its curious female, of Djilolo. Batjan is also somewhat rich in Pieridæ, specially the *Delias* group, and the graceful *Celestina* or lavender-and-yellow group.

I am indebted to the Hon. Walter Rothschild for the opportunity of figuring this species from the Felder types, which are in his museum at Tring.

FIG. 4. P. CRITON *Felder* ♀.

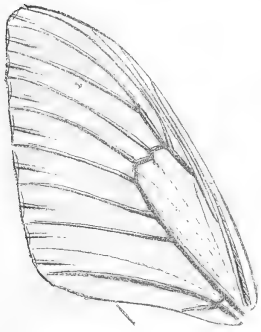

FIG. 6*a*

NEURATION OF ANTERIOR WING.

FIG. 5. UNDERSIDE OF P. CRITON ♀.

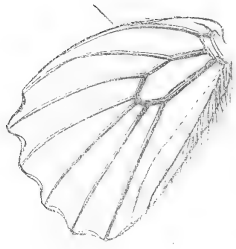

FIG. 6*b*.

NEURATION OF POSTERIOR WING.

POMPEOPTERA PLATO.

Ornithoptera Plato, Wallace, "Trans. Linn. Soc.," V. 25, p. 40, n. 13 (1865). ♂ only.
Ornithoptera Plato, Wallace (Translated by Staudinger) "Iris" IV., p. 74 (1891). ♂. [As a local form of *Criton* from Timor].
Papilio Plato, W. F. Kirby, "Syn. Cat. Diurnal Lepid.," p. 530. (1871).
Ornithoptera Plato, Röber, "Tijdschr. V. Ent.," XXXIV. p. 269 (1891). ♂ ♀.
Troides Plato, Rothschild, "Novitates Zoologicæ," Vol. II., p. 209, n. 15 (1895).
Pompeoptera Plato, Rippon, "Section *Troides*" (in Wytsman's "Genera Insectorum," p. 13 (1902).

Of the ♂ of this species Wallace, in the Trans. of the Linnæan Society, remarks that "it resembles *O. Criton* very much, but the abdomen is almost wholly black beneath; that it has no red patches at the base of the wings, or any red collar." But it will be shewn by the following description, and by my figures that Mr. Wallace was in error, probably from examining a worn specimen. A figure of the ♀ published by Felder under this name in the "Wien. Ent. Mon.," must have been described and named under a misapprehension, especially as he was unaware of the locality in which it was found.

♂. Anterior wings deep brown black; the adnervular light rays very much subdued and delicately darkened—looking more like a series of grey-brown cloudings in the black of the disc; the veins are all, however, very prominent. The undersurface resembles the upper, but the light adnervular rays are broader, nearly confluent, and bluish-grey; this gray also encroaches within the cell, and the pseudoneura are shown prominently passing through the grey area; a few scattered grey atoms are found just above the submedian vein, at the posterior angle of the wing.

Posterior wings. The central golden-yellow area occupies one half of the cell, and about one half the disc of the wing—is lunated towards the entire outline between each vein—and runs diagonally across the wing towards the basal or inner-marginal directions, its greatest width being double the area of the dark portion extending towards the base; all the wing except the yellow area is a deep velvety-black, shot with a grey sheen. The undersurface is similar to the upper, except that the inner outline of the yellow in the cell is somewhat sinuate; the fringe lunules of all the wings, on both surfaces, are white.

The thorax, head, and abdomen above are black; underside of the pronotal collar is red, antennæ black; thorax with the basal red patch; dorsum of abdomen black except the last 5 annulations, 4 of which are partially greenish-yellow—the anal valves brown; legs black, long, and slender.

Length of costa 65 mms.; of outer margin 55 and of inner margin about 36 mms.; greatest width 36 mms.; greatest width of posterior wing 30, and length 45 mms.

Length of abdomen or antennæ 23, and of thorax with head 23 mms.

Length of legs:	1st pair:	femur	11;	tibia	9;	tarsi,	11	mms.
	2nd ,,	,,	11;	,,	14;	,,	15	,,
	3rd ,,	,,	9;	,,	11;	,,	15	,,

Hab. Oinainisa, Timor.

♀. Anterior wing light brown; 1-3rd of the cell, distal end, ochraceous white; the discal rays broad and of the same colour, subdued by brown atoms.

Undersurface, as above, but the light portions whiter; fringe lunules ochraceous white.

Posterior wing black, with a narrow discal and discocellular band golden-yellow, but whitish towards the inner margin; a row of discal yellow spots, nearly obsolete; the anal angle ochraceous white.

Undersurface of wing as above, the light yellow area, and discal band of spots more distinct and white; an apical > shaped light mark; the fringe lunules as on the anterior wings.

Head, thorax and abdomen above, brown black—the latter short with yellow lateral continuations of the subdorsal yellow, near the termination of the abdomen. Under side of thorax with the legs black, long, and slender, and the usual basal red patch; abdomen yellow, but the segments strongly accentuated with black.

Length of costa 78, of outer margin 56, and inner margin 44 mms.; greatest width of posterior 38, and length 54 mms.

Length of abdomen or antennæ 25, and of thorax with head 22 mms.

Length of Legs with trochanters	1st pair:	femur,	10;	tibia,	10;	tarsi,	13	
	2nd ,,	,,	12;	,,	15;	,,	20	
	3rd ,,	,,	11;	,,	15;	,,	16	

Hab. Oinainisa, Dutch Timor.

From the Tring Museum.

POMPEOPTERA CRITON, VAR. *FELDERI.*

Troides Criton, var. Felderi, ♂ Rothschild, "Novitates Zoologicæ," vol. ii., page 210 (1895).

♀. Anterior wings dark brown, with the adnervular light rays, especially the upper ones, so densely scaled with brown atoms as to render them almost obsolete; the distal end of the cell with a light patch of one third the cell length also as densely scaled; the veins sufficiently expressed; the dark brown of the wings with a distinct olive-green sheen, when seen in certain positions.

Undersurface as above, but the light adnervular rays and marks of the disc and cell are reddish and greenish-grey, and only slightly subdued by scaling: the brown of the wings has also a more silky greenish sheen than on the upper surface; the pseudoneura are well shown in the cell, though invisible on the upper surface; the fringe lunations are continuous, and rufous white.

Posterior wings dark brown, with a silky greenish texture; a large discal area of orange-tinted white, which encroaches one-fourth within the cell, and contains five large submarginal black ovoid spots; in the subcostal area above them are two light spots, indicating the continuation of the light area, but broken up; the outer margin is gracefully scalloped, and the fringe rather redder in colour than the discal light area; the light lunations below the black ovoid spots are thickly scaled. The under-surface of the wings the same in pattern as above, but the submarginal row of black spots (six in number) are smaller than above, the light spaces below them are only slightly scaled, the outer marginal brown band is strongly dentate, the light area is whiter than on the upper surface, and the base of the wings darker than above; the marginal fringe very rufous.

Length of costa of anterior wing 70 mms.; of outer margin 39 mms. Greatest length of posterior wing, 45 mms.; greatest width 35 mms.

Head and thorax velvety brownish-black; eyes very dark brown; abdomen rufous brown, with lateral and subdorsal yellow, subdued by brown atoms, and with lateral black dots and the articulations strongly expressed with black.

Antennæ densely black, legs black, thorax with the usual red pectoral patches.

Length of abdomen or antennæ 27 mms., of thorax with the head 20 mms.

Habitat: Halmaheira.

Figured on plate 41.

POMPEOPTERA CRITON, VAR. *OBERTHÜRI.*

Troides Criton, var. *Oberthüri*, ♀ of Rothschild, "Novitates Zoologicæ," vol. ii., page 210 (1895).

A much larger variety, more in size like *P. Critonoides* of Frühstorfer, from the island of Oby, and very much in pattern like *P. Riedeli* ♀ of Kirsch: in fact a description of *Riedeli* would almost do to represent the characters of Oberthüri.

Anterior wings velvety black, the veins stout and prominent; the adnervular rays ochraceous white, subdued towards their distal ends by black scaling, and broad at nearest to the cell; within the cell at the distal end 1-4th of the area is also ochraceous white, subdued by scaling, the whole forming a very prominent white transverse, central area of about 1-4th of the entire wing, or about 24 mms. at its broadest and 12 mms. at its narrowest; this light area extends across the wing from the 2nd subcostal to the 3rd median nervules—at the latter it is isolated as an independent adnervular ray, terminating at each end equidistant from the outer margin and the discoidal cell; faint trace of the rays are found on the submedian fold. The pseudoneura can be traced in the light end of the cell on both surfaces.

Under surface of the wings as above.

Posterior wings velvety black; a large discal area, and the distal 1-3rd of the cell golden yellow; the five rather large ovoid black discal spots united with the very broad submarginal black border; the abdominal marginal and submedian area silky brown, with a greenish tinge.

Under-surface as above, except that the black is not quite so velvety, and a small light yellow streak is found midway of the submedian fold.

Head, thorax, and abdomen somewhat pilose velvety black on the dorsi; eyes nitid black; thorax on the subdorsum and the legs, black; with the usual pectoral red patch; abdomen yellow, with broad black articulations and the usual row of lateral black dots; the anal tuft dark brown.

Length of costa 78 mms.; of posterior margin 58, and of interior margin 43 mms.; greatest length of posterior wing 49 and of width 34 mms. Length of thorax with the head 22 mms.; of abdomen or antennæ 29 mms.

The pronotal collar is carmine red.

Habitat: Halmaheira. Taken by the late Mr. Doherty in 1892.

It may be remarked that this ♀ is distinctly unlike that of the type form of Criton. In the latter the rays of either of the anterior wings are only faintly traceable; in Oberthüri we see that the light portions are very conspicuous; on the two surfaces of the posterior wings there is very little difference between the two forms. The ♀ of Oberthüri is also much larger than that of the typical form of *Criton*.

The type form is found in the northern part of Batjan or Seki Island, and Oberthüri at Halmaheira in the large Bay east of the island of Djilolo or Gilolo. Whether the ♂ of Oberthüri differs in any respect from that of the typical *Criton*, I am unable to say; but generally the females of the respective species of Troides have a greater tendency to variation than have the males.

I must here take the opportunity of saying that the figs. on my plate of Criton are redrawn from the Felder types, while those on pages 28 and 29 of this vol. are also from specimens in Mr. Rothschild's Museum; and I am indebted to him for the pleasure of describing the vars. *Felderi* and Oberthüri, and figuring the latter.

I would also call attention to the great differences between the respective females of the Felder type, in plate 40, of the typical form on page 29, and the var. 5, *Oberthuri* and *Felderi* on plate 41.

POMPEOPTERA IRIS.

Ornithoptera Iris, Röber, "Ent. Nachrichten," page 369, ♂ ♀. (1888).
„ „ Staudinger, "Iris," iv, page 74 (1891) (as a local form of Haliphron?)
„ „ Röber, "Tijdschrift voor Ent." vol. xxxiv., page 270 (1890). (Iris differentiated from Haliphron).
Troides Haliphron Iris, Rothschild, "Novitates Zoologicæ, vol. ii., page 208 (1895).

♂. Anterior wings intensely velvety black, shot with grey reflections; adnervular rays only just visible, or almost shaded into the black of the wing. Undersurface as above, except that the adnervular rays, and a slight indication of white at the distal end of the cell are rather lighter; fringe lunules dull white, and very delicate.

Posterior wings velvety black, shot with grey reflections; a narrow discal band of yellow extending from the subcostal nervure to a speck of yellow outside the 3rd median nervure; a small speck of yellow also at the distal end of the cell. Underside as above, except below the median vein and over the submedian area, which is rather lighter black.

Head, antennæ, thorax, and abdomen densely black, anal valves reddish black; pronotal collar red; underside of thorax black and red, abdomen black, legs robust and black.

Length of costa of anterior wing 61, of outer margin 58, and inner margin 30 mms. Width of posterior wing 25, and length 39 mms. Length of abdomen or antennæ 26, and of head and thorax 20 mms.

Length of Legs with trochanters { 1st pair: femur, 9; tibia, 9; tarsi, 12 / 2nd „ „ 9; „ 12; „ 15 / 3rd „ „ 9; „ 12; „ 15

♀. Anterior wings light brown; adnervular light rays sordid creamy-white, extending from the cell almost to the hind or outer margin, and from the costal nervure to the 3rd median nervule, again partly along the submedian fold, with a large leaf-like mark at or near the anal angle, through which the distal portion of the submedian vein passes. The sordid whitish mark also occupies rather more than 1-3rd of the distal portion of the cell. Undersurface as above, except that the light marks are less sordid; fringe rays creamy white and delicate.

Posterior wings deep black, with olive grey reflections; the central yellow patch of ruddy yellow is small, only extending on the disc from the 1st discoidal nervure to the submedian fold, and 1-4th of the cell at its distal end, or less than 1-4th of the whole wing; fringe lunules creamy white; undersurface as above, the yellow area whiter in tint.

Head, antennæ, eyes, thorax and abdomen above and below varying degrees of rather dark brown; pronotal collar red; pectoral patch also red.

Length of costa of anterior wing 75, of outer margin 56, of inner margin 46 mms. Length of posterior wing 50, and width 33 mms. Length of abdomen or antennæ 26 mms.; of thorax with the head 21 mms.

Length of legs with trochanters { 1st pair, femur, 10; tibia, 9; tarsi, 10. / 2nd „ „ 13; „ 13; „ 14. / 3rd „ „ 12; „ 13; „ 13.

Habitat, Island of Letti.

The originals of my figures on Pl. 64*b*, and the subjects of these descriptions are in the Tring Museum of the Hon. Walter Rothschild.

The pseudoneura in the cell of the anterior wing are in two groups, in both sexes. In the ♂ the 1st or upper pseudoneurus originates at a short distance from the base of the subcostal vein, and terminates just beyond the base of its 3rd branch; the 3 other pseudoneura commence at the base of the wing, spreading out fan-like to the distal end, or 2-3rds of the extent of the cell. In the ♀ the arrangement is very nearly the same, but the 1st and 4th commence at the base, while the 2nd and 3rd branch off a little above the base of the 4th.

[The ♀ of this species closely resembles the var. of *Dohertyi* ♀ figured on Plate 64, figs. 7 and 9, but the posterior wings are more dentate in *Dohertyi* ♀, and the ♂ of *Iris* is smaller and different in outline from the same sex of *Dohertyi*. The pseudoneura of *Dohertyi* in both sexes are arranged in 2 groups of 2 each, the 2nd branching from the 1st at 1-3rd of its length, and the 4th branching from the 3rd at half its length,—thereby showing that the two forms are only distantly related.]

POMPEOPTERA RIEDELI.

Ornithoptera Riedeli, Kirsch, "Proceedings of the Zoological Society," page 275, note 1, t. 19, f. 1 (♂). 2 (♀) (1885).
" " Röber, "Tijdschr. voor Ent." vol. xxxiv., page 266 (1891). (♂ ♀).
" " Grose-Smith and W. F. Kirby, "Rhopalocera Exotica," vol. ii., Orn. p. 3 t., 2 f. 1. (♂). 2. (♀). 1892.
Troides Riedeli, Rothschild, "Novit. Zoologicæ," vol. ii., p. 211, n. 17. (1895).

♂. Anterior wings. Costa arcuate, though rather more slightly than in the ♀; the outer margin nearly straight, but sufficiently curved into the costa at the apical angle; interior margin nearly straight; wings velvety or silky black, with a greenish sheen; only the very faintest indications of the light adnervular rays on the 3 median nervules. Under surface as above, except that the nervules have more or less broad light rays attached, but greatly subdued to a dark grey by black scaling; the pseudoneura only visible in the cell on the under-surface —the lowest or 3rd bifurcating very near to the distal end of the cell.

Posterior wings, velvety-silky black, with a very broad discal area of rich ruddy golden yellow, and a small area of the same colour at the distal end of the cell; this area of yellow is beautifully opalescent when viewed obliquely opposite the light, almost as richly as in the ♂ of *Magellanus*, only the opalescent prevailing tone is olive green; the submarginal black border is fairly broad, and lunate between each vein; the outer margin of the wing is slightly lunate, with only the slightest trace of the light fringe lunations; the veins running through the yellow area are well pronounced in black.

Under surface as above, except that the yellow is less coppery in tone, and the opalescence more richly green. The abdominal-marginal fringe short and sparse. The head, antennæ, thorax, and abdomen velvety or silky black, pronotal collar carmine or coral red; eyes nitid dark brown. The subdorsum of the thorax is black, the legs nitid black, the red pectoral patch only slightly seen; the abdomen sub-dorsum black, with the three lower articulations slightly yellow, and the anal valves brown.

Length of costa 68 mms.; of outer margin 47 mms.; of inner margin 33 mms; greatest length of posterior wings 44 and width 27 mms.

Length of thorax with the head 25 mms.; of abdomen 25, and of antennæ 30 mms.

Length of Legs:	1st pair,	Femur,	8;	Tibia,	7;	Tarsi,	8	mms.
	2nd ,,	,,	11;	,,	10;	,,	10	,,
	3rd ,,	,,	10;	,,	11;	,,	17	,,

Habitat: Timor Laut. In the Author's Museum.

♀. Anterior wings. Almost entirely like the upper wings of *Criton* var. *oberthüri*, ♀, except that the light area of the distal end of the cell is not quite so large, the ab-nervular light rays are whiter, and extend almost to the outer margin, and the black of the wings slightly warmer in tone. Under surface as above.

Posterior wings like those of *Oberthüri* except that the yellow discal area is not quite so extensive, being reduced between the 1st and 2nd discocellular nervules to four spots of colour; that only a minute yellow spot is found at the distal end of the cell, the discal ovoid black spots are broader, and either separated by black-scaled yellow from the submarginal black band, or where connected are laterally scaled in the same manner; the submarginal black is acutely lunate towards the discal spots, and the outer margin rather more lunate or dentate; there is also a light fawn-coloured patch between the 3rd median branch and submedian fold, and a slight light scaled line on the lower part of the abdominal margin. Under surface as above, except that the yellow portions are less ruddy in tone, there is no dark scaling, and the fawn-tinted white of the submedian area above becomes yellow on the underside. The yellow portions of the wing on both surfaces are, when viewed obliquely opposite the light, opalescent green—most prominently on the underside. In *Oberthüri* this is not the case.

Length of costa of anterior wing 82 mms.; of outer margin 58 mms.; of inner margin 45 mms. Length of posterior wing 55, and greatest width, 39 mms.

Head, antennæ and thorax black, eyes nitid dark brown; abdomen warm silky-brown. Under side of thorax velvety black, with the usual lateral red patches; the legs nitid black; abdomen black the last four articulations laterally and subdorsally scaled, and golden yellow; anal tuft brown; the lateral black dots only four in number. Only three of the anterior cell pseudoneura are traceable beneath, the 2nd or central one seen prominently in the distal white area.

Length of thorax with head, 10 mms.; of abdomen or antennæ, 15 mms.

Length of Legs:	1st pair,	Femur,	10;	Tibia,	10;	Tarsi,	13	mms.
	2nd pair,	,,	11;	,,	12;	,,	15	,,
	3rd pair,	,,	10;	,,	12;	,,	16	,,

Habitat: Timor Laut.

If we were only acquainted with the ♀ of this species we should be inclined to regard it as a fine example of Criton v. *oberthüri*, notwithstanding the difference of locality; but the knowledge of the ♂ makes it a certainty that it is a different species from *Oberthüri*, and an instance of persistence of typal pattern in the females.

In the Author's Museum.

Timor Laut is the largest of a group of small islands situated south-west of the Aroe or Aru Archipelago, and exactly west of the Southern part of New Guinea and Prince Frederick Henry Island, in the Arafura sea. Tenimber Island is a little north, and the Kei Islands, north-east of Timor Laut. All these islands are rich in fine Papilionidæ and Ornithoptera.

POMPEOPTERA ÆACUS.

Ornithoptera Rhadamanthus, Boisduval, "Species Géneral Lépidoptera," vol. i., page 180, note 8 (♀, *nec* ♀ var. a, *nec* ♂ (1836) ♀.
" " Doubleday, Westwood and Hewitson, "Genera Diurnal Lepidoptera," vol. i., page 4, note 10 (1846) ♂ ♀.
" " Horsfield and Moore, "Cat. Lep. E-India, Comp. Museum," vol. i., page 88, note 1857) ♂ ♀.
" " Reakirt, "Proc. Ent. Soc. Philadelphia," p. 444, n. 1 (1864) ♂ ♀.
" " Moore, "Proc. Zool. Soc.," p. 755 (1865). ♂ ♀.
" " Druce, "Proc. Zool. Soc.," p. 108, n. 1 (1874). ♂ ♀.
" " Distant, "Rhop. Malayana," p. 326, n. i. t. 27a, fig. 5 (♀), and p. 327, f. 106 (♂) (1885).
" " Wood-Mason and Nicéville, "Journal Asiatic Soc. Bengal," p. 373, n. 172 (1886). ♂ ♀.
" " Elwes and Nicéville, "Journ. As. Soc. Bengal," p. 438, n. 148. (1886). ♂ ♀.
" " Elwes, "Trans. Ent. Soc. London," p, 422, n. 393 (1888). ♂ ♀.
" " Watson, "Journal As. Soc. Bengal," p. 53, n. 205 (1891). ♂ ♀.
" " Swinhoe, "Trans. Ent. Soc. Lond.," p. 311, n. 371 (1893). ♂ ♀.
" " Leech, "Butterflies of China," p. 513 (1893). ♂ ♀.
" " de Nicéville, "Gazetteer of Sikkim," p. 170 n. 457 (1894). ♂ ♀.
Papilio Rhadamanthus, Gray, "Cat. Lep. Ms. B. Mus.," vol. i., p. 6., n. 14 (1852).
" " Gray, "List Lep. Ins. B. Mus." vol. i., p. 5, n. 16 (1856).
Ornithoptera Æacus, Felder, "Wien. Ent. Mon." vol. iv., p. 225, n. 71 (1860). ♀.
Papilio Œacus, Felder, "Verh. z. b. Ges. Wien," p. 291, n. 33 ♀.
Ornithoptera Rhadamanthus, v. Amphrisius, Kirby, "Syn. Cat. Diurn. Lep." p. 520 (1871) ♂.
" " Staudinger and Schatz, "Exot. Schmett.," vol. i., p. 4. (1884). ♂.
" " **Fickert,** "Ueber die Zeichn. Gatt. Orn.," p. 733, 743 (1889). ♂.
" " var. *Thomsoni*, Bates, "Thomson's Straits of Malacca," p. 546 (1875). ♂.
" **Minos,** Oberthür, "Et. d'Ent., vol. iv., p. 32, n. 14 (1879).
" " " " " vol. xi., p. 14 (1886).
Papilio (Ornith.) Rhadamanthus, Nicéville, "Journ. As. Soc. Bengal," p. 98, n. 255 (1883). ♂ ♀.
Ornithoptera Œacus, Manders, "Trans. Ent. Soc. Lond., p. 535 (1890). ♂ ♀.
Troides Œacus, Rothschild, "Novit. Zoologicæ," v. 223, n. 20 (1895). ♂ ♀.
Ornithoptera Œacus, Moore, "Lepidoptera Indica," vol. v., p. 148, plate 422, f. 1, 1a (1901-1903). ♂ ♀.
Pompeoptera Æacus, Rippon, in Wyteman's "Genera Insectorum," Fam. Papilionidæ, Sec. Troides," p. 14. (1902).

In the examination of a large series of the oriental species Æacus, ♀, we are at once struck by the amount of variation within very restricted limits to which the different examples are subject: and the fact also that though no two specimens are quite alike, yet the wing patterns are always practically identical one with the other. The differences appear to be on the anterior wings in the width of the adnervular discal rays, the amount of sordid white in the cell, and the more or less broad and graceful character of the submedian light area. On the secondary wings the discal black marks between the veins vary in length and breadth in the different examples—thereby continually modifying the amount of the yellow area, though not to any great extent, and the appearance of the indented submarginal band is also slightly affected. I give, on the plate devoted to this species figures of Felder's type, which may be compared with those drawn from examples in my own collection, to illustrate my point. It is also of interest to note the remarkably close resemblance of the ♀ ♀ of this species, to some of those of *Cerberus*, another widely distributed oriental form. The ♂ ♂ of Æacus exhibit very little tendency to variation—though the bodies of no two examples are alike in the way in which the yellow and black are distributed; but the ♂ ♂ of *Cerberus*, on the posterior wings, vary incessantly in the number of the black orbicles on the disc, as is the case very much with the Javan *Pompeus*.

♂. Primaries deep velvety black; the light adnervular rays extend from the 3rd median branch up the disc to the third subcostal vein; they are broad in the middle portion of the disc, and extend in length nearly close to the outer margin of the wings; they are all semi-diaphanous, and denseley but minutely scaled, so as to greatly subdue their whiteness into a nitid grey: the light of any bright object can be seen through these rays, when the insect is held it: if the insect is held over a dark object all the rays appear very dark grey, but as a matter of fact they take the colour faintly of any object over which the wing is placed.

This observation it may be here stated, applies very much to the rays of some of the other forms of the Genus Pompeoptera; only a faint trace of this nitid grey is found at the distal end, and halfway along above the median nervule, in any of the examples; the veins of the wings are very black and stout, but the submedian nervure is only just traceable in the black of the lower part of the wing. The under surface of the primaries is nearly as above, except that the cell contains a larger area of grey: the central black band is divided by grey, the pseudoneura are well shown, the adnervular rays are broader and lighter, and the space above the submedian vein is partly occupied with the same intensity of grey—the interior margin alone being quite black: thus the underside is altogether much lighter than the upper side.

The posterior wings are a rich silky golden yellow; the veins are very black—the median and discocelluar nervules being the stoutest; the base is black; a submarginal band of three rather long conical, one dentate, and two lunate black marks constitute the black outer margin of the wing—the three lowest with a bordering and apex of black scales; the submedian area and abdominal fold are black.

The undersurface as above, except that the hind submarginal black marks are more uniform in shape and without any bordering of black scales; the submedian black is narrow from the base till half-way, when it broadens out to the 3rd median vein, with a small triangulate yellow spot near to the inner angle; and the abdominal margin is silky rufous; the abdominal marginal fringe of black hairs inconspicuous.

[In an example from Rossel Island, on both surfaces of the posterior wings, between the 2nd and 3rd median nervules is a discal suboval black spot. In another example, the submedian area is silky yellow, with two black spots at its lower end; and the light rays of the anterior wings on the undersurface are considerably broader than in the examples quoted above.]

Head and thorax velvety black; antennæ black; pronotal collar coral red. Underside black, with the usual pectoral red patches; legs black; eyes nitid brown. Abdomen above, rufous grey, and black towards the anal end, the articulations lemon yellow; on the underside yellow, with the usual lateral black dots; anal valves dark creamy-white.

Length of costa of anterior wing 68 mms.; of outer margin, 50 mms.; of inner margin, 33 mms. The posterior wing rounded, with the costa much curved—the abdominal margin nearly straight, and 31 mms. in length. Greatest width of wings 28 mms., greatest length 39 mms.

Length of abdomen or antennæ 26, and of thorax with head, 20 mms.

Length of Legs	1st pair :	Femur,	9;	Tibia,	7;	Tarsi,	10	mms.
	2nd ,, .	,,	10;	,,	11;	,,	12	,,
	3rd ,, :	,,	11;	,,	10;	,,	13	,,

♀. Anterior wings rufous black; the adnervular rays grey white, with a creamy tint, all delicately scaled. The grey white streaks of the discoidal cell extend from the distal end half way towards the base of the wing, thereby framing in one half of the black cell area; in this light grey frame the pseudoneura are quite seen; in some examples the black area is divided half-way towards the base by the grey into two beautfully shaped pyriform marks, their widest ends being at the distal part of the cell, and the second or central pseudoneurus passes midway through the grey like a true vein; the other pseudoneuræ are well shown in the grey framing, until they are lost in the black towards the cell base; but between these two varieties of cell pattern there are many gradations, till in some examples the grey almost entirely occupies the cell nearly to the base, leaving the black pyriform marks very small and shorter in length.

The undersurface of the wing as above, only that the light marks are a little lighter, and not scaled, except in the cell, and the black becomes more of a greyish brown.

Posterior wings, outwardly lunate, yellow; the outer margin consists of a band of seven cone-like black lunations, extending into the disc about 10 mms. each, or 13 mms. each from the base of each section of the outer margin; a transverse discal band of seven pyriform black marks, varying in length, of which the two nearest the abdominal margin are the longest, and the mark midway of the disc is the smallest; the base of the discoidal cell to 1-3rd is black, and also the base of the submedian area—the latter being creamy-whitish entirely to the inner margin, and slightly scaled; one half of the lower part of the wing, nearest to the abdomen, is dark scaled; the veins are very stoutly black, especially the the subanal ones, the latter separated from each other by yellow, and from the black of the marginal lunations; and the scaling of the corresponding portion of the wing on the upper side is absent from the undersurface.

Head, antennæ, and thorax black, eyes castaneous nitid brown, pronotal collar crimson, underside of thorax and legs black, with the usual lateral or pectoral crimson patches. Abdomen above dark silky brown: beneath yellow, with two rows of lateral black dots, [the males have only one], anal tuft deep fleshy red.

Length of costa 86 mms.; of outer margin 64 mms.; of interior margin 40 mms.; greatest width of wing 45 mms. Greatest length of the posterior wing 52 mms.; greatest width 38 mms.

Length of Legs:	1st pair :	Femur,	11;	Tibia,	6;	Tarsi,	10	mms.
	2nd ,, :	,,	12;	,,	8;	,,	13	,,
	3rd ,, :	,,	12;	,,	8;	,,	15	,,

Habitat. Assam. In the Author's Museum.

An example of the ♀ of this species in my collection, from Omei Shan is bluish-grey on the anterior wing rays; the cell has two short narrow pyriform black marks only, and is densely scaled on a grey ground nearly to the base; and the discal and submarginal black marks of the posterior wing on the under surface are rather smaller, the submarginal more oblong, more separate from the black frings lunules, and the discal marks are quite conical. Length of anterior wing costa 82 mms. The underside of the abdomen with the second row of lateral black dots so large as to occupy nearly all that part of the body.

In a second example from the same locality, all the marks of the posterior wing are broader and longer, so as almost to touch each other, and to greatly restrict the yellow area of the disc on the upper surface.

[Note.—The scaling of the lower half of the posterior wings on the upper surface is a constant character in the ♀ of this species, and serves to readily distinguish it from the ♀ ♀ of *Minos* or *Cerberus*.]

Habitats: Cochin China; Darjiling; Bengal; Siam; Malay Peninsula; Cachar; Tavoy and Sinbyoodine; common in the hot valley of Sikkim—at an elevation of 2,000 to 3,000 feet, common in low valleys from May to October; Chin Lushai; Khasia Hills in Assam; China many localities; Western China; Nepaul; Moulmein; Tonking; var. of the form (*Thompsoni*) Straits of Malacca; Burmah; Ta-tsien-lu; Shan States; Tenasserim; Masuri (N.W. Himalaya); Dacca; Sagaing or Saigon? Ava (Lower Burmah); The Hills of Chittagong; Upper Mekong; Omei Shan; Rossel Island.

A specimen of the ♂ from Oby or Obim Island in the Author's Museum, only differs from the typical examples from other localities in having on both surfaces of the posterior wings, just above the submarginal cone, and between the 2nd and 3rd median branches a suboval black spot, and an increased density of the delicate black hairs which flow longitudinally over the yellow area within the 2nd and 3rd median branches, and the submedian yellow from the base.

The Island of Oby, or *Obim* as it is spelled in my map in vol. I., and also in the old maps of this region, is a small mass of land situated south, with a slight inclination east of Batjan, in longitude 127°20′ to 128°10′, and S. latitude 1°15′ to 1°40′.

ORNITHOPTERA - DARSIUS.

Ornithoptera Amphimedon ♀, Doubleday and Hewitson, "Genera Diurnal Lepidoptera," t. 1, f. 2. (1846.)
Papilio Darsius, Gray, "Cat. Lep. Ins. Brit. Mus." I., p. 5, n. 11. (1852.) ♂ ♀.
" " Gray, "List. Lep. Ins. Brit. Mus." I., p. 4, n. 13. (1856.) ♂ ♀.
" " Horsfield and Moore, "Cat. Lep. Ins. Mus. East India Company," I., p. 87, n. 176, t. 2, f. 2, 2a, larva, pupa. (1857.)
" " Felder, "Wien Ent. Monatschrift," iv., p. 97, (1860.) ♂ ♀.
Ornithoptera Darsius, Tennent, "Nat. Hist. Ceylon," p. 425. (1861.)
Papilio Darsius, Felder, "Verh. zu bei Ges. Wien," p. 291, n. 24. (1864.) ♂ ♀.
Papilio " W. F. Kirby, "Syn. Cat. Diurn. Lepid." p. 519. (1871.)
Ornithoptera Darsius, Oberthür, "Études d'Entomologie," iv., p. 30, n. 8. (1879.) ♂ ♀.
Ornithoptera " Moore, "Lepidoptera of Ceylon," vol. i., p. 155, figs. 1, 1a, 1b. (1881.) ♂ ♀.
" " P. H. Gosse, "Clasping Organs in certain Lepidoptera," in "Proc. Linn, Soc." series II., Zoology, vol. ii., pp. 286, 287, plate xxvi., figs. 8-11. (1888)
" " Fickert, "Ueber die. Zeichn. Gatt. Ornith." pp. 736 and 743 (in Zoologischen Jahrbüchern). (1889.) ♂ ♀.
" " F. A. Walker, "Oriental Entomology," part ii., p. 15. (1889.)
Troides Darsius, Rothschild, "Novitates Zoologicæ," vol. ii., p. 203, n. 10. (1895.) ♂ ♀.
" " Moore, "Lepidoptera Indicæ," vol. v., p. 149, plate 418, fig. 1. larva and pupa, 1a, 1b. (1901-1903.) ♂ ♀.

This species is only to be found in the Island of Ceylon. As far as I am aware no example has ever been taken in any other locality. It is also the only species of Troides inhabitating Ceylon, a rather remarkable fact, considering that other much smaller eastern islands and localities are richer in the forms of this group, and that Ceylon supplies over 16 species of Papilio, the majority of which are found commonly also in India. Of other butterflies of the 1st sub-family of Papilionidæ, viz., the Pierinæ, about 27 species, belonging to 9 Genera also inhabit the island, making in the two sub-families, about 44 species, or 11 Genera; or, allowing for new discoveries since the time when Sir E. Tennent wrote his Natural History of Ceylon, 50 species and 11 or 12 genera—a very fair number for one family of Lepidoptera.

O. Darsius is generally found hovering over the flowers of the heliotrope, according to Sir E. Tennent, seeking the honey which that flower supplies; but the larva feeds on the leaves of the *aristolochia*, and the *betel* leaf. It is the largest of the Ceylon DIURNEA—though rivalled sometimes by the glorious *Papilio polymnester*, and the spectre like *Hestia Jasonia*. Of course, among the Heterocerous Lepidoptera we find much larger species; as for example *Attacus atlas*, the cinnamon feeding moth, common at Columbo, often 12 inches in expanse of wings; *A. lunula*, *Antheræa Myletta* (the Tusseh silk moth which feeds on the wild almond *Terminalia Catappa*, and the castor oil plant), *A. Assama*, and *Tropæa Selena*, the milky-green swallow-tailed silk moth. Indeed, in almost every part of the world the *Bombycidæ and Noctuidæ* furnish many much larger insects than are to be met with among the day butterflies, with the exception of the S. and Central American *Caligos*.

♂. Anterior wings a rich velvety black; the adnervular rays almost obsolete, or only faintly visible—being so intensely subdued by brown-black scaling; the veins only just detectable. Undersurface of wing, as above, except that the light rays are less obscure, especially those bordering the 3 median nervules: which are of subdued olive-grey; the black areas of the wing are slightly shot with bluish olive green; the veins on this surface appear to be very thin.

Posterior wings, velvety black; the lower third of the discoidal cell golden yellow; a broad discal area of the same yellow divided into 6 compartments by the veins; outer submarginal band very broad, and sinuate: the outline of the wing lunate: the light fringe lunules only slightly visible in the wings; the veins dividing the yellow area of the disc very stout and jet black; the abdominal fold which conceals the *androconia* deep brownish-black. Undersurface in every respect as above, except that the black is slightly shot with bluish reflections; and the inner margin is rufous brown. The pseudoneura of the anterior wings are faintly visible.

Head, antennæ and thorax, velvety black; eyes, nitid brown; pronotal collar, red, but obscure: abdomen, dorsally piceous-brown—the annuli slightly indicated with yellowish-grey—subdorsally the abdomen is yellow, subdued by brown scales; anal valves brown-grey. Undersides of thorax black, with the usual pectoral red marks.

Length of costa, 74 mms.; of posterior margin, 52 mms.; of interior margin, 40 mms. Greatest width of wing 38 mms. Greatest length of posterior wing, 50 mms.; and with, 30 mms.

Length of abdomen or antennæ, 32 mms.; of thorax with head 20 mms.

Length of Legs { 1st pair: Femur, 9; Tibia, 7; Tarsi, 11 mms.
2nd " . " 11; " 12; " 14 "
3rd " : " 10; " 11; " 14 "
including the trochanters.

Habitat: Ceylon.

The area of yellow at the distal end of the posterior wing cell varies in the different individuals of this sex, as well as in shape; in some it is rather more extensive than in the example described above; in others it is only an obsolete spot, while in others the whole cell may be black. On the undersurface of the anterior wings also the adnervular rays in some examples are well expressed, and all of them much lighter than in the above example; the subdorsum and sides of the abdomen also may be found well marked by a double row of black spots or patches, becoming coalescent, and filling the whole of the basal annuli. Length of costa in two other examples 70 and 84 mms. respectively.

♀. Anterior wings a rich raw-sienna brown; the ad-nervular rays very prominent and creamy-white, especially nearest the cell, but greatly subdued towards the outer margin; the triangular space partially bounded by the 2nd and 3rd subcostal nervules is white, and there are also 3 white subcostal lines above this; the submedian fold with a short white double line; the submedian vein is also bordered 1.3rd its length with a creamy-white ray; the distal end of the cell with a small double arcuate white mark; all the veins prominent and blacker than the colour of the wing. Undersurface nearly exactly as above, except that the discal rays are a little lighter than above. Fringe lunules creamy white, and sufficiently prominent.

Posterior wings deep black from the base to within about 1.4th of the distal end of the cell, and transversely in a nearly straight line from the submedian fold to the 1st discocellular nervule; then follows a rather narrow discal area or band of yellow, divided into compartments by the thick black veins, the distal fourth of the cell being of the same colour, and the submedian portion creamy-white; next comes a transverse discal broad band of black cones and marks, extending from the submedian vein till it blends with the costal black; an outer transverse band of yellow marks or dentations, subdued by scaling follows, and lastly a broad submarginal border of black lunations, with their fringe lunules prominent, and creamy-white; the abdominal marginal fold is dark sienna brown.

Undersurface as above, except that the anterior wings are darker, and the rays lighter: and that all the black parts of the posterior wings are darker, and the yellow much brighter.

Head, antennæ and thorax, velvety black; pronotal collar, narrow and crimson; eyes, nitid brown; abdomen above, rufous brown; lateral and dorsal portions, yellow, with double rows of black spots; the 3 annuli nearest the base almost filled up with black: the anal articulation quite rufous black; thorax beneath, with the crimson lateral or pectoral spots; legs, black.

Length of costa, 82 mms.; of outer margin, 60 mms.; of inner margin, 40 mms; greatest width of wing, 50 mms.; greatest length of posterior wing, 50, and width 37 mms. Length of abdomen or antennæ, 50 mms.; of thorax with head, 15 mms.; width of abdomen, 10 mms.

Length of legs { 1st pair: femur 10; tibia, 8; tarsi, 10 mms.
2nd ,, : ,, 14; ,, 11; ,, 14 ,,
3rd ,, : ,, 15; ,, 12; ,, 15 ,,
including the trochanters.

There is a certain amount of blue sheen on the undersurface of the anterior wings.

Habitat: Ceylon.

In another example of the ♀ the anterior wings and the posterior cell are a lighter and warmer brown, and the general black of the posterior wings tends towards warm brown, while all the yellow areas are of a more subdued yellow on the underside of the wings. Length of costa of the anterior, 85 mms. In a third and smaller example the light rays are more restricted and subdued on the anterior wings, which are warmer brown; the upper or basal half of the posterior wing is warm rufous brown; the yellow discal area is narrower, and the lower half of the wing black, with only a transverse band of nearly obsolete yellow cuneiform marks; the fringe lunules, dull yellow—all the lighter marks on the undersurface of both wings being a little brighter and more defined. Length of anterior costa, 71 mms.

Habitat: Ceylon.

In the Museum of the Author.

POMPEOPTERA MINOS.

Papilio Eques Trojanus Minos, Cramer, "Pap. Exot." vol. iii., 4, t, 195, f. a. (1779.) ♀.
Papilio Eques Trojanus Astenous, Fabricius, "Spec. Ins." vol. ii., p. 10, n. 38. (1781.)
„ „ „ „ Jablonsky and Herbst, "Naturs. Schmetterlinge," vol. i., p. 206, n. 7, t. 4, f. 2. (1782.)
„ „ „ „ Gmelin, "Syst. Nat." vol. i., 5, p. 2234, n. 297. (1790.) ♀.
„ „ „ **Minos,** Esper, "Ausl. Schmett." p. 127, n. 56, t. 32, f. 1. (1792.)
„ „ „ **Astenous,** Fabricius, "Ent. Syst." vol. iii., I., p. 19, n. 52. (1793.) ♀.
Papilio Amphrysius, Godart, Encycl. Méth., vol. ix., p. 27, n. 7. (1819.) ♀.
Ornithoptera Heliacon, Boisduval, "Species Géneral Lepidopteres," vol. i., p. 178, n. 7. (1836.) ♀.
Papilio Pompeus, var. *e Minos,* W. F. Kirby, "Syn. Cat. Diurn. Lep." p. 518. (1872.)
„ **Minos,** Oberthür, "Études d'Ent." iv., p. 32, n. 14. (1879.) ♂ ♀.
„ **Pompeus,** var. Minos, Wood Mason, "Journal Asiatic Society Bengal," p. 86. (1881.) ♂ ♀.
„ **Minos,** Staudinger and Schatz, "Exotische Schmett." vol. i., p. 5. (1884.) ♂ ♀.
„ „ Aitken, "Journal Bombay Nat. Hist. Soc., p. 35, n. 73. (1887.) ♂ ♀.
Papilio (O.) Minos, Hampson, "Journal As. Soc. Bengal," p. 363, n. 193. (1888.) ♂ ♀.
„ „ Davidson and Aitken, Ibid, p. 361, n. 64. (1890.) (Life History).
„ **Pompeus,** var. *Minos.* Fickert, "Ueber die Zeichnungsv. Gatt. Ornith." p. 730. (1890.)
Papilio (O.) Minos, Fergusson, "Journal Bombay Nat. Hist. Society," p. 445, n. 167. (1891.)
Troides Minos, Rothschild, "Novit. Zoologicæ," p. 203, n. 11. (1895.) ♂ ♀
Ornithoptera Minos, F. Moore, "Lepidoptera Indica," vol. v., p. 142, pl, 419, figs. 1 larve and pupæ, 1a, ♂, 1b, ♀. (1901-1903.)

♂. Anterior wings velvety or silky black, with a greenish-olive sheen, when viewed obliquely opposite the light; the adnervular light rays in some positions almost obsolete,—in others just visible,—if held over any light object, such as a sheet of white paper, they appear somewhat prominent, and of a dull reddish black, the membrane at such positions being semi-diaphanous, silky, and densely scaled with infinitely minute dark atoms; half-way from the base of the wing the median nervure and a small portion of the 3rd nervule is bordered with pale yellow, subdued by black atoms, as is also the upper part of the median nervure. All the veins except the costal and subcostal, and the submedian are well shown and stout; the pseudoneura, examined obliquely, are sufficiently visible; the fringe lunules of the outer margin are very thin, and are white. Underside of anterior wing as above, except that the adnervular rays are very prominent and greenish white, yellowish towards the bases of the median vein, and that the outline of the discoidal cell within is prominently bordered with the same light colour nearly to the base of the median, and 1-3rd from the distal end to the 1st subcostal nervule; the pseudoneura are like true veins, and slightly and gracefully bordered also with the light marks; a few grey atoms between the 2nd and 3rd submedian branch, and two submedian grey rays are also present.

Posterior wings rich silky golden yellow, filling the whole cell, and occupying nearly the whole of the disc; the submedian and abdominal-marginal areas are velvety black; the precostal basal area reddish black; the black hind-marginal band or border is very broad, deeply lunate, or rather, dentate towards the disc: the apices of the two lower dentations with a small patch of black scaling; a mass of very delicate black hairs flow from the of the cell on to the yellow, half-way of its length, and over the median and submedian areas; the outer marginal white fringe lunations are very thin; the outline of the posterior margin is delicately lunate. Undersurface as above, except that a small black discal spot is within the 2nd and 1st median nervules: all the marginal dentations are bordered with greenish yellow-grey stripes: a grey line borders the 3rd median branch: an orbicular black spot is found on the same branch, just above its corresponding dentation: a congeries of grey atoms is on the submedian black: and the abdominal fold underside is fawn-brown, to which is attached a dense fringe of black hairs. The yellow on both surfaces of the wings is suffused slightly with a pale green; the veins stout and very black.

Length of anterior wing costa, 74 mms.; length of outer margin 54 mms.; length of inner margin 37 mms.; greatest width of wing about 46 mms.; greatest length of posterior wing 47, and width 37 mms.

Thorax and head velvety black; antennæ black; eyes nitid brown; underside of thorax brown-black, with the usual lateral red patches; legs nitid dark brown; thorax yellow, with a central longitudinal stripe of fawn yellow; anal valves fawn-grey; abdomen dorsally yellow, with two lateral rows of black dots or spots, the uppermost only partially visible.

Length of abdomen or antennæ, 32 mms.; of thorax with head, 22 mms.

Length of Legs:	1st pair;	Femur,	11;	Tibia,	7;	Tarsi,	11	mms.
	2nd „;	„	12;	„	10;	„	12	„
	3rd „;	„	13;	„	11;	„	13	„

Habitat: Shivaroy Hills.

♀. Anterior wings dark brown—slightly lighter towards the outer margin; adnervular light rays all very prominent, and gracefully formed, each one terminating very near the outer margin, and ochraceous grey in tint, slightly reduced and shaded outwardly by atomic scaling; the angle between the 2nd and 3rd subcostal nervules is also of the same tint; the submedian vein runs through a bordering of the same tint from about half-way from the base to near the outer margin, the lower division of the light-tinted mark being extended to the inner-marginal outline by a coalescent patch of light atoms; the inner outlines of the discoidal cell from the distal end to within a little of the base is of the same light tint, so reduced towards the base by red-brown scaling as to be lost in the dark brown at very near the base of the cell; the costa is very black to about half-way from the base; the veins are all very stout and dark, and the pseudoneura can be sufficiently traced at their terminals: the submedian fold is also fairly shown.

Undersurface as above, except that all the light rays are somewhat brighter: there is a light submedian fold-ray, and the submedian nervure runs through a broader light area: the light inner borderings of the cell outline is lighter and more conspicuous—extending along the median vein to the base, and from the discocellular and subcostal veins to within one-third of the base; the 2nd pseudoneurus unites with the discocellular nervule as a continuation of the black of the cell.

Posterior wings deep rich golden reddish-yellow, rather subdued in tone within the cell from the base by brown-black hairs; this yellow occupies nearly the whole of the cell, and extends, with the interruptions of the dark cones over 2-3rds of the disc; a broad discal transverse row of large black cones, of which the largest is on the upper part of the disc, have their bases towards the outer margin, and their apices towards the cell; a very broad black outermarginal band, is lunate or sinuate at its inner outline; the outline of the hind margin is lunate, with yellow fringe-lunules; the base of the wing is black; the precostal area is brown, and the whole of the submedian area and fold to the interior margin is warm rufous brown, with a light stripe at the inner or abdominal angle.

Undersurface of wing as above, except that the subcostal area is black, the discal black cones and divisions of the outer-marginal border are edged slightly with white; of the latter the two lower divisions thereby become oblong, there is also a small spear-shaped white mark on the outer side of the 3rd median branch, and a second below what is a narrow black rudimentary cone in the submedian area—the remainder of the fold and inner margin being rufous brown; with a yellowish stripe from the rudimentary cone to the abdominal angle, and a continuation of the yellow inner marginal outline.

Thorax, head, and antennæ deep black; eyes nitid brown; underside of thorax and legs black, with the usual lateral red patches; abdomen above rufous brown, beneath yellow, with the usual lateral row of black spots.

Length of costa 87 mms.; of hind or outer margin 58 mms.; of inner margin 45 mms.; greatest width of wing 50 mms. Length of posterior wing 52 mms.; width 38 mms. Length of abdomen or antennæ 30 mms.; of thorax with head 20 mms.

Length of Legs:	1st pair:	Femur, 10;	Tibia, 7;	Tarsi, 14 mms.
	2nd ,, :	,, ;	,, ;	,,
	3rd ,, :	,, ;	,, ;	,,

The other two pairs of legs were lost from the specimen.

Habitat: Malabar Coast. In the collection of Mr. F. Moore.

A second ♀ from the same locality has the number of adnervular light rays on the anterior wings restricted to the four median branches, and these deeply shaded; the light edging inside the cell is also very restricted and rudimentary; there is a faint clouding of white scales beneath the submedian nervure. The black discal cones in the yellow of the posterior wings are shorter than in the specimen described above: the under surface of all wings similar to the corresponding example described above, only all the lighter marks are brighter and more conspicuous: and the lateral black dots of the abdomen are larger. Length of costa 79 mms.

Habitat? In the collection of Mr. F. Moore.

A ♀ from Northern India also has the anterior wing rays all well shown, but sordid grey; on the undersurface as above, but brighter. The discal black cones of the posterior wings shorter than in the first example quoted—the large black spot between the 1st and 2nd subcostal nervules excepted; the subcostal area is rufous brown; a small basal portion of the cell is black; and a long subconical black mark is attached to the 3rd median branch, in the submedian area. Undersurface as above, except that the cones are shorter—their apices slight black-scaled, and the abdominal lateral black spots are very large. Length of costa of anterior wing, 71 mms.

Habitat: Darjiling.

In the Author's Museum.

A ♀ from Sumatra has the light rays restricted to the upper part of the anterior wings, and rendered sordid by scaling; there is a light patch at the distal end of the cell, divided by the 2nd pseudoneurus, also scaled; on the undersurface this is rather larger and lighter, and the normal number of rays are present, and also brighter: on the posterior wings the black cones are shorter, broader, and more obtuse than on the first example described, and their bases coalesce with the apices of the submarginal band-dentations; undersurface as above; the cones are also six in number. The lateral black dots of the abdomen are large, and in two rows, and the subdorsal yellow is very bright and pure. Length of costa, 85 mms.

Length of Legs:	1st pair:	Femur, 10;	Tibia, 8;	Tarsi, 12 mms.
	2nd ,, :	,, 11;	,, 12;	,, 15 ,,
	3rd ,, :	,, 11;	,, 11;	,, 15 ,,

In the collection of Mr. F. Moore.

A ♂ from the Shivaroy Hills differs from the ♂ described above only in having on the undersurface of the posterior wings a small, almost obsolete black on the disc between the costal nervure and 1st subcostal, and 1st and 2nd subcostal nervules; and the submedian black are with a central patch of white atoms.

Also in Mr. Moore's collection.

Localities in which Minos has been taken:—Trevandrum, Malabar, Bombay, Nilghiri Halls—(from 3,000 to 7,000 feet altitudes), Travancore (common up to 4,000 feet), S. India, Tenasserim (small examples), Buxa (in Bhutan), Cannanore (Malabar), Assam, China, Sumatra, Shivaroy Hills, Rangoon, Darjiling.

In the character of the wing patterns, this species bears a striking resemblance in both sexes to *Vandepolli*. The ♂, though not generally quite so large as *Vandepolli* is almost identical in pattern—the chief differences being that the anterior wings are relatively narrower, and slightly less rounded at the apical angle, the light rays are rather less defined; the black of the posterior wings occupies no part of the cell, whereas 1-3rd of the cell area from the

base is black, as is also the basal part above the cell in *Vandepolli*: the yellow spaces between the veins in Minos are less broad, and the outermarginal band has no scaling at the apices of the dentations in *Vandepolli* on either surface: Minos has sometimes a discal black spot or two on the discal undersurface, but *Vandepolli* has none. The abdomen of *Vandepolli* is black above, in Minos it is fawn colour: the anal valves in the latter are grey-pearly fawn, and black in the former. But at a glance it can be seen that *Vandepolli* is very distinct as a species from Minos. In the ♀ ♀ it will be seen that the anterior wings of *Vandepolli* are altogether broader than those of Minos, in all examples; the wing-rays are very broad and prominently grey-white in most of the examples of *Vandepolli*, but often almost obsolete in Minos: the distal end of the cell has always a larger grey patch than has Minos, and the pseudoneura are most prominent: the hind wings are more alike in the two species, but with occasional exceptions the discal black cones of *Vandepolli* are larger and longer than those of Minos, and the hind marginal black border has its divisions less lunate at their apices in *Vandepolli*; important differences may be seen between the colouration and markings of the abdomen of the two forms. The locality for *Vandepolli* is Java, but Minos does not occur in that island. Yet notwithstanding their resemblance, it is evident that the two forms are quite specifically distinct, though their relationship is very close.

The ♀ ♀ of *Æacus* (*Rhadamanthus*) on the underwings bear a rather close resemblance to some of those of Minos —the arrangement, form and position of the black markings being very similar; the same may be said of the Javan *Pompeus* and its Indian Analogue, *Cerberus*, thereby exhibiting a not very distant relationship to each other.

POMPEOPTERA STAUDINGERI.

Pompeoptera Staudingeri, Röber, "Entomologische Nachrichten," page 369. (1888).

♂. Primary wings above velvety or silky black. The light discal adnervular rays are sufficiently prominent, creamy grey towards the outer margin; bluish dark grey towards the discoidal cell; the cell is immaculate black, with the faintest indication of a grey outline at the distal end; the pseudoneura in the cell are fairly prominent; the veins are all very prominent; the outer marginal fringe with creamy-white lunules.

Under surface of primaries very dark and silky brown; the adnervular rays very light greyish white, free from dark scaling (contrary to what they are on the upper surface), and extending almost to the outer margin; there are no white marks on the disc below the 3rd median nervule; the cell which is black with 3 white streaks from midway to the distal end, whereof the first and third are the broadest; the marginal fringe lunations rather whiter than above.

Secondary wings, deep velvety or silky, black; with a discal area of rich golden yellow, extending from the subcostal nervure to the 3rd median nervule. This area or yellow band occupies exactly half the surface of the disc above the 3rd median nervule, the remainder of the disc consisting of a broad submarginal black band; the distal 1-3rd of the cell golden-yellow; the submedian and inner marginal areas black, the line indicating the position of the inner marginal fold sufficiently visible; the usual fringe lunules are absent; a number of light hairs flow from the base of the wing over and below the cell.

Undersurface of wing nearly as above except that the yellow area between the costal and 1st subcostal veins occupies less space than on the upper surface, is suffused slightly with a greenish tint, especially nearest the costa, a thin line of yellow atoms is in the black beneath the subcostal, a few similar atoms are in the cell close to the yellow area, a small group is below the 3rd median nervule, and two thin lines of atoms follow the course of the 2nd and 3rd median nervules into the submarginal black band.

The posterior wings are delicately lunate on the outer margin, the light fringe lunules are visible on the under surface. The outer margin of the anterior wing is nearly straight. The inner marginal fringe of brown hairs is fairly conspicuous. Head, antennæ and thorax are velvety black; the eyes rufous brown; the pronotal collar red; abdomen dark rufous brown. Beneath, the legs are long, graceful, and slender; the thoracic red patch very prominent and extensive on both sides; the dorsal part of the abdomen is yellow.

Length of costa of anterior wing 57 mms; of outer margin 44 mms.; of inner margin 31 mms. Greatest length of posterior wing 40 mms.; greatest width 26 mms.

Length of antennæ or abdomen 25 mms.; of thorax with the head 20 mms.

Length of Legs:	1st pair:	Femur,	10;	tibia,	8;	tarsi,	11	mms
	2nd ,, :	,,	12;	,,	14;	,,	15	,,
	3rd ,, :	,,	11;	,,	10;	,,	16	,,

Habitat: Selaru, Loeang Island, Babber.

In the Tring Museum.

♀. Anterior wings rufous brown, not very dark in tint; the adnervular light rays are very broad and conspicuous, and extend from the upper to the lower part of the wing —that is to say, they border all the veins and the submedian fold from the costa to the submedian nervure, and reach nearly to the outer margin in their course; they are rufous grey in tint, and subdued by brown atoms: the spaces between the lower ones are also lightly sprinkled with grey atoms on the brown of the disc; more than half the discoidal cell is occupied from the distal end by a streaky grey patch of atoms enclosing a dark patch; the veins are all very obtrusive; the fringe lunules greyish white.

Undersurface as above, except that the light discal rays are more rufous grey, and purer in tint, and not subdued by dark atoms; the light cell area is as above, slightly more extensive, with some dark atoms uniting the basal brown with the distal white.

Posterior wings deep silky or velvety black; only a very limited area or discal band of golden silky yellow occupies about 1-5th of the disc from the 1st subcostal vein to the submedian fold, the latter section subdued with white; the distal half of the discoidal cell is also of the same yellow; the inner, or abdominal margin is rufous brown, with a marginal white streak, and some white atoms; the precostal cell is rufous brown; all the rest of the wing is deep silky or velvety black, with bluish reflexions; the fringe lunules are dark grey; a mass of dark hairs flows over part of the golden areas from the base.

Undersurface as above, except that the yellow is not so pure, and the black slightly rufous towards the outer margin; there are two adnervular discal yellowish spots midway of the disc on the 2nd subcostal, the discoidal, and 1st median veins; and the 2nd and 3rd median nervules are slightly bordered with light yellow atoms nearly to the outer margin.

The outer margin of the anterior wing is nearly straight (or only slightly lunate); the posterior wing is more lunulate.

Head, antennæ, and thorax, warm velvety black; eyes rufous brown; abdomen above, rufous brown; lateral parts more rufous, and with lateral black dots on yellow and white atoms above the yellow; subdorsum yellow, with two rows of black marks between the articulations. Thorax with prominent red pectoral patches. Legs, nitid black and slender.

Length of costa, 76 mms. ; of outer margin, 53 mms. ; of inner margin 45 mms. Length of posterior wing, 52 mms. ; of costa, 37 mms. ; of abdominal margin 40 mms. Greatest width of wing, 31 mms. Length of abdomen or antennæ, 41 mms. ; of thorax with head, 23 mms.

Length of Legs :	1st	pair :	femur,	10 ;	tibia,	9 ;	tarsi,	12 mms.
	2nd	,, :	,,	11 ;	,,	11 ;	,,	13 ,,
	3rd	,, :	,,	11 ;	,,	11 ;	,,	16 ,,

Habitat : Selaru, Loeang Island, Babber.

This species is related to *Plato* and *Iris*, and is certainly a member of the Haliphron group. Its nearest affinity is with *Iris*.

In the Tring Museum.

I am indebted to the Hon. Walter Rothschild for the use of the examples from which the above descriptions are written.

Babba, or Baba Island as it is spelled in the Admiralty's Chart, is one of a small group of islets situated at a comparatively short distance west of the Tenimber Islands in the Banda Sea, in about 131° east longitude and 90° south latitude, or about 100 miles due west of the Tenimber Group. The recorded depth of the ocean at about this locality is 2627 fathoms, that is to say nearly the deepest recorded part of the sea between the West Coast of New Guinea and Timor on the south-west, and the Celebes on the north-west—the deepest part of the Banda Sea is 2880 fathoms. The depth diminishes in the direction of Celebes and Timor, though not so greatly as it does to the east and north-east towards New Guinea. The seas of Banda, Arafura, and Flores are thickly studded with archipelagos and small islands ; and doubtless many interesting local forms of Pompeoptera will be found on these islets, which appear to be pretty rich in insect life, and its different orders. Loeang Island belongs to the same group.

POMPEOPTERA HALIPHRON, *var. PISTOR.*

Troides Haliphron, sub-species *pistor*, W. R. Rothschild, "Novitates Zoologicæ," vol. iii., page 91, 1896.

This form, which I did not sufficiently mention on page 25 of this volume, is described by Mr. Rothschild as "♂ very similar to T. Haliphron *pallens* of Oberthur, but differs in the abdomen being less edged with yellow beneath, and in the first discal yellow mark on the hind wing being usually smaller."

"♀. Most specimens as pale as *pallens*, some darker; differs chiefly in the abdomen being less edged with yellow underneath, in the discal area of the hind wing being below more yellow, often as yellow as above, in the yellow spot in the cell being less extended, reaching only as far as the origin of the subcostal nervure, in the first discal yellow mark being larger, and in the whitish mark behind the cell being less extended down towards the base."

"Habitat: Kalao Island and Djampea Island, between Celebes and Flores."

These islands are in the sea of Flores, about 121° east longitude, and 90°50′ south latitude.

POMPEOPTERA HELENA.

Var. PAPUENSIS.

Ornithoptera Helena, var. *Papuensis* ♀, Wallace, Trans. Linn. Soc. Vol. XXV., pp. 38, 39. (1865).
Troides Oblongomaculatus papuensis, Rothschild, Novitates Zoologicæ, Vol. II., p. 214. (1895).

Linnæus' species HELENA appears to have differentiated into a number of local forms, of great interest, which are very instructive when studied together. Several of these are now known, but probably others yet remain to be discovered. Of one of those described by Wallace, with the above varietal name, no male was known to him; and as far as I am aware, no description has hitherto been published of the sex. The responsibility therefore devolves upon me to give such a diagnosis as may be necessary, after which Mr. Wallace's brief description will follow, so as to enable us to understand the types; and this will be followed by a more detailed description from the example figured on plate 45 of this work.

POMPEOPTERA PAPUENSIS, ♂. *Mihi.*

Primaries: Smoky black, silky and shaded into olive brown towards the outer margin. Underside similar except that the colour becomes more fuscous towards the posterior margin. The veins and wing-folds fairly conspicuous on both surfaces. Secondaries, a rich golden yellow on either surface, the veins deep black in the yellow, with a broad black posterior marginal border, irregularly curved or dentated inwardly; not quite 1-3rd of the discoidal cell obliquely black towards the base, and all but a small portion of the space between the costal nervure and 1st subcostal branch the same colour; the space within the precostal nervure fuscous brown; under surface similar in every respect, except that the yellow towards the hind margin bordering all the veins is softened off into a subdued green, containing black atoms which follow the broad black border; the abominal margin and fold are black, shot with a bluish grey opalescence.

Thorax and head velvety black; collar crimson scarlet; underside fuscous brown, with pectoral red spots; legs black; eyes chesnut brown; antennæ black; spirotrompe a moderate length; abdomen yellow beneath; dorsal, fawn brown, the last 3 segments accentuated with yellowish white; anal valves pearly light fawn, with a minute dot midway, close to the segment; 5 lateral black dots on the abdomen.

Antennæ with 48 articulations.

Length of costa 66 mms.; width of Primary 30 mms.; length of secondary wing 40 mms.; width 30 mms. Length of antennæ or abdomen 25, and of thorax with head 17 mms.

Length of Legs { 1st pair, femur 8, tibia 9, tarsi 14 mms.
2nd ,, ,, 11 ,, 11 ,, 12 mms.
3rd ,, This pair of legs was absent from the specimen.

Hab. New Guinea.

Type in the collection of Mr. Walter Dannatt, who kindly allowed me the pleasure of describing and figuring his example.

POMPEOPTERA PAPUENSIS, ♀. *Wallace.*

I quote from Wallace's paper in Trans. Linn. Soc., Vol. xxv., pp. 38, 39.*

"O Helena . . . . . *b*, local form *Papuensis: Female* sooty black, 2 first branches of the sub-costal nervure margined with whitish near their origin; markings of the lower wing of the same tint of orange yellow as is *O Helena* ♂, but not so glossy. *Male* not known. Hab. New Guinea, Salwatty (Wall)."

The type is probably in the Hewitson Collection, British Museum, under the name *O. Helena.*

♀. From Mr. W. Dannatt's collection. Primaries silken greenish-brown or black; the 5 branches of the subcostal nervure, the 2 discoidal nervules, and the 1st and 2nd median nervules passing through yellow ochraceous, white, or cream coloured rays from their origin; the same light colour within the discoidal cell, but graduated into the black by black atoms. Under surface similar, except that the light mark within the cell extends subcostally to near the base; fringe lunules ochraceous white. Secondaries golden yellow, with brown black hairs near the abdominal margin, and a broad border of black to nearly 1-3rd of the wing, broadly and strongly, and irregularly indented. The black also occupies nearly the basal half of the cell, all but a small portion of the costal, sub-costal spaces, and the space below the 1st subcostal branch; in the area of black in the latter region is a reddish yellow mark deeply curved on each side; and between the 2nd subcostal and the discoidal branches is a large orbicular sub-marginal black spot. The under surface is similar, except that the dentations of the marginal black border, and the orbicular spot are subdued by light atoms, the last but one enclosing a small black spot surrounded by the light atoms; there are also whitish suffusions on the yellow between the nervules extending from the hind margin towards the base; the yellow of both surfaces of the wings is redder and richer than in the ♂.

Thorax, black reddish-brown; collar, crimson-scarlet; head black, eyes reddish-brown; antennæ black. Under side of thorax brown, with pectoral crimson patches. Abdomen smoky silky-brown; lateral parts whitish ochraceous; subdorsal more yellow, with a row of 6 lateral black dots; anal tuft, red ochraceous.

The pseudoneura on the upper wing are fairly prominent.

Length of costa 86 mms.; width of upper wing 42 mms. Length of lower wing 54 mms., width 40 mms. Length of abdomen or antennæ 30 mms.; thorax with head 30 mms.

* *On the Phenomena of variation and Geographical Distribution as illustrated by the* Papilionidæ *of the Malayan Region.*

Length of legs { 1st pair, femur, 9; tibia, 9; tarsi, 13 mms.
2nd ,, ,, 10; ,, 12; ,, 15 ,,
3rd ,, ,, 11; ,, 12; ,, 16 ,,

Articulations of antennæ, 48.

Hab., N. Guinea

♀. In the museum of Messrs. Godman and Salvin. Upper wings rich fuscous-brown; the white outer end of the cell and margins of the veins faintly but broadly indicated, being subdued by the brown atoms till they are fuscous brownish-white. The whole colour of the wings that of a *Euplœa;* the two middle pseudoneura are well defined with a dark clouded longitudinal mark between them. Secondaries of the normal type. Under surface similar, but lighter in colour.

Length of costa 82 mms.

Hab. N. Guinea; out of Saunders' collection.

A *Male* in the Godman-Salvin coll. has a depth of the black border of the hind wing of 12 mms. The costal length of this ♂ is 69 mms. Hab. Port Moresby, N. Guinea.

It should be observed that the shape of the abdomen of this species or variety (in the ♀ at least) differs much from that of other species, as will be seen by a reference to plate 45.

POMPEOPTERA HELENA.

Var. Melpomona, *Var. Nov.*

♂. Primaries rich velvety black, shot with dead green reflections; veins well defined; median nervure fairly stout. Under surface similar, with a little fuscous toward the outer margin. Secondaries: the yellow more greenish-lemon than in *Papuensis*. The area of the yellow about the same in proportion as in *Papuensis;* the black areas of the wing nearly similar on both surfaces to those of *Papuensis*; the sexual abdominal pouch silky greenish-black; fringe hairs rather long. The tooth-like projection of the yellow into the black border between the 2nd subcostal branch and discoidal nervure, is as strongly shown as in the other forms. There is a tendency for the subcostal nervure to branch out into a black abnormal vein on both surfaces. [See plate 45.] I have noticed this phenomenon on the lower wing of several species of Rhopalocera; and it is occasionally to be met with on the upper wing. I have also seen two or three examples among the *Ithomiæ*, and *Heliconidiæ*.] The *pseudoneura* are fairly visible in the discoidal cell of both surfaces of the Primary wings.

Length of costa 72 mms.; width of upper wing 41 mms.; length of hind wing 45 mms.; width 35 mms.; length of abdomen or antennæ 28 mms.; of thorax with head 20 mms. The crimson pronotal collar thin, and only faintly seen. Articulations of antennæ 44 mms.

Hab. New Guinea.

The type is in the rich museum of the Hon. Walter Rothschild.

♀. Primaries olive-greenish silky brown; creamy white within the cell, with black graduated atoms, the area of which is 1-3rd of the cell (in *Papuensis* it is only about 1-5th); also a slightly greater area of creamy white without the cell. Under surface similar, except that faint cloudings of creamy atoms are on each side of all the nervures, almost to the exterior margin. Secondaries: in *Papuensis* the yellow occupies about half the area of the wing: in *Melpomona* only slightly over 1-3rd, and is of a *redder* tint — almost orange (a yellow subdued by ochraceous red scales); the yellow within the submedian nervure and its 3rd branch is whitish towards its lower end, and continued in the black above as yellow atoms, as is the case with *Papuensis*; between the 2nd subcostal branch and discoidal nervule are two faint yellow spots, or wedge-shaped marks, indicating the position of a continuation of the yellow patch, with a tendency towards forming a suborbicular black patch as in *Papuensis*; also a few aggregated atoms of yellow just below the 1st subcostal nervule; abdominal margin of wing soft smoky brown. Under surface of secondaries; the yellow area in salmon colour; the marginal black border broad, within which are four orbicular black spots, united by a broad black line, with the border set on a sinuated ground of grey atoms, which modify the salmon yellow beneath; a narrow sinuate transverse mark of grey atoms between the 1st and 2nd subcostal nervules; fringe lunules salmon coloured white.

Abdomen: dorsum, fuscous brown; subdorsum, ochraceous salmon-coloured whitish; with 6 lateral black dots.

Length of costa 75 mms.; width of upper wing 41 mms.; length of hind wing 50, and width 41 mms.; length of abdomen or antennæ 27 mms.; articulations of antennæ 42; length of thorax with head 18 mms.

Length of Legs. { 1st pair: femur, 9; tibia, 9; tarsi, 12 mms.
2nd ,, : ,, 11; ,, 12; ,, 15 ,,
3rd ,, : ,, 10; ,, 11; ,, 16 ,,

Hab. New Guinea; but locality unknown.*

The type is in the museum of the Hon. W. Rothschild, who gave me the pleasure of describing and figuring this beautiful and interesting form.

* I would here take the opportunity of emphasising the importance of attaching labels with definite localities to all specimens sent home from foreign countries. Simply to say that a species was taken in *New Guinea*, is not much more satisfactory than to give *S. America* as the habitat of a butterfly or beetle, or the *Indian Ocean* as that of a shell, as was formerly the custom in many collections and even books. To know the exact locality of a specimen is *always* most desirable. Every true naturalist will endorse this proposition.

POMPEOPTERA AMPHRYSUS.

Papilio Eques Trojanus Amphrysus, Cram., "Pap. Exot. III. p. 43, t. 219, Fig. A. (1782). ♂.
Papilio Amphrysus, Jablonsky, "Naturs. Schmett.," I. p. 197, n. 2, t. i. f. 3 (1784). ♂
„ „ Esper, "Ausl. Schmett," p. 133, n. 59, t. 34, fig. 1 (1792). ♂.
„ „ Fabricius, "Mant. Ins." p. 3, n. 23 (1787). ♂
„ „ Gmelin, "Syst. Nat." I. 5, p. 2230, n. 287 (1790). ♂.
„ „ Fabricius, "Ent. Syst.," III. 1, p. 11, n. 33 (1793). ♂.
Troides Amphrysus, Hübner, "Verz. bek. Schm." p. 88, n. 923 (1816). ♂
Papilio „ Godt., "Ency. Méth." p. 27 (1819), ♂.
„ „ Gray, "List. Lepid. Ins. B. Mus." I. p. 6, n. 18 (1856). ♂.
Ornithoptera Amphrysius, Boisd, "Spec. Gén. Lép." I. p. 178, n. 6, t: 1. B. f. 1. (1836). ♂ ♀.
„ „ Doubld., Westwood and Hewitson. "Gen. Diurn. Lepid." I. p. 4. n. 8 (1846).
„ **Amphrysus,** Vollenhoven, "Tijdchrift" v. Ent. III. p. 71, n. 8 (1860) ♂ ♀.
Papilio Amphrysus, Felder, "Verh. z. bei. Ges. Wien," p. 291, n. 34 (1864) ♂ ♀.
Ornithoptera Amphrysus, Wallace, "Trans. Linn. Soc." Vol. XXV. p. 38 (1865).
Papilio Amphrysus, Butler, "Cat. Diurn. Lep. descr. Fabr." p. 235, n. 5 (1869) ♂ ♀.
„ **Amphrysius,** W. F. Kirby, "Syn. Cat. Diurn. Lep." p. 520 (1871).
Ornithoptera Amphrysus, Druce, "Proc. Zool. Soc." p. 356, n. 2 (1873).
Ornithoptera Amphrysus, Oberthür, "Études d'Entomologie" IV. p. 30, n. 9 (1879) ♂ ♀.
„ **Amphrisius,** W. F. Kirby, Cat. Coll. Diurn. Lep. of W. C. Hewitson p. 1. (1879).
Ornithoptera Amphrysus, P. H. Gosse, "Clasping Organs in certain Lepidoptera," Trans. Linn. Soc. Lond. V. II, Zool. p. 281, 292 (1883).
Ornithoptera Amphrysus, Staud. and Schatz, "Exot. Schmett." I. p. 5 (1884).
Ornithoptera Amphrysus, Fickert, "Ueber die Zeichnungverhältnisse der Gatt. Ornith." Separatabdruck aus den Zoolgischen Jahrbüchern, p. 739 (1889).
Troides Amphrysus, Rothschild, "Novitates Zoologicæ," p. 228, n. 25 (25a) (1895).
Ornithoptera Amphrysus, W. F. Kirby, "Handbook to the order Lepidoptera Vol. II. p. 265 (1896).
„ „ E. Martin Duncan (in Cassells' Nat. Hist. Vol. VI. p. 51) (1896).
„ „ V. *palabuana*, Frühstorfer, Ent. Nachr. p. 44 (1894.
Pompeoptera Amphrysus, Rippon, in Wytsman's "Genera Insectorum" (Lep. Rhopal Sec. *Troides*) p. 13. (1902(.

The Amphrysus group of Pompeoptera is rather rich in local forms, each of which merits (for convenience sake), a distinguishing name. We have, first, the type form which occurs in Java (especially the Western portion of that large island); next we find in Sumatra the form *Sumatranus* of Hagan closely resembling the type, but with the veins of the lower wings more prominently curved in the ♂, the yellow adnervular rays less prominent or almost obsolete on both surfaces, with minor alterations of the colour of the abdomen, and the yellow area of the hind wings strongly suffused with green, somewhat like what obtains in *cuneatus* of Oberthür. Sumatra is N.W. of Java, and there is no difficulty in understanding that in the two localities, which are comparatively near to each other, some slightly modified forms (but only slightly) would occur; though it is remarkable that Oberthür's *cuneatus* (a rather smaller insect than the type), also inhabits W. Java. In this latter there is rather more yellow on the anterior wings; the yellow hind wings are suffused with green, as in *Sumatrana*, and there are 4 cuneiform discal black marks on both surfaces of the ♂. The form *ruficollis* of Butler from Borneo and Sumatra has less yellow on the upper wings than the type, the adnervular rays are nearly white instead of yellow; and the posterior wings may be said to be entirely yellow except a delicate lunular black border; the abdomen is yellow with a faintly pink dorsal stripe. All these possess, as in the type form, a red pronotal collar, more or less hidden by the pilose black of the thorax; but Druce's *flavicollis* from Borneo is distinguished only from *ruficollis* by its yellow collar on both sexes. Now Borneo is a considerable distance east from Sumatra and North from Java, so that the presence of two or three such closely allied forms suggests the possibility of many more intermediate links being yet discovered. Another var. *palabuana* of Frühstorfer comes from Palabuan in Java; and *ruficollis* has been taken in Malacca a long way N. West of Borneo, and in Nias, a small island off the nearly central coast of Sumatra. But if we travel onwards to the N.E. and North of Borneo the process of differentiation from the type form is seen to have resulted (in the Philippine archipelago), in the beautiful *Magellanus* of Felder, with a ♂ very like that of the type, the hind-wing yellow area being shot on both surfaces with a rich opalescence—which also, only in a lesser degree, appears on the ♀. In the ♀ ♀ there are important colour differences, chiefly on the hind wings—also a considerable difference on the anterior wings of *flavicollis*—still greater in *Magellanus* on all the wings.

Considered altogether, we may regard all the known forms of *Amphrysus*, with the exception of *Magellanus*, as living, roughly considered, within an area bounded by an isosceles triangle—or very approximately 24,000 square miles.

♂. Anterior wings brownish black with yellow adnervular rays; the yellow area with black atoms extending from the subcostal vein to the 1st median branch; below the latter the yellow is only half the length of the vein, one half of the space nearest the median nervure being occupied by black; a thin area within the cell at the distal end is yellow; a yellow discal spot is bisected by the 2nd median nervure; a yellow discal spot, forming a line on

the upper side of the 3rd median nervule, and a small linear spot of yellow is on the submedian nervure at the anal angle. Undersurface similar to the upper, except that the discal row of yellow rays is complete, not interrupted. The Posterior wings are a rich golden yellow, with all the veins delicately formed, the upper branches beautifully curved, and very black; the submarginal black border is delicately and gracefully dentated inwardly, with a black elongate spot united to the dentation within the 2nd and 3rd median branches, or at near the anal angle; the abdominal margin to the submedian nervule is black; the fringe-lunules yellowish-white and very slightly shewn. The fringe-lunules of the anterior wing are also white. The undersurface only differs from the upper by the anal angular black spot adjacent to the dentation being very faintly represented; the abdominal margin black and rufous brown.

Head, antennæ and thorax black; abdomen with a dark and light-brown broad longitudinal dorsal stripe, gradually narrowing towards the anal segments; all the remainder of the abdomen, above and below, a rich greenish golden yellow, thickly and minutely dotted all over, and with the usual lateral black dots. The pronotal collar, and the lateral portions of the thorax red; the legs black and lower portion of thorax with mixed black and yellow scales; abdominal fringe rather long, and rufous.

Length of costa 80, of outer margin 50, and of inner margin 37 mms.; length of posterior wings 44, and width 35 mms.; length of abdomen or antennæ 28 mms.; of head and thorax 20 mms.

Length of Legs with trochanters { 1st pair: femur, 10; tibia, 10; tarsi, 11 / 2nd ,, ,, 11; ,, 13; ,, 14 / 3rd ,, ,, 11; ,, 12; ,, 16

♀. Anterior wings moderately light brown, darker towards the outer margin, with 6 trigonate moderately long yellowish-white marks or rays on the disc from the submedian nervure to the 1st median nervule, and the remaining adnervular rays or marks, brownish-white and well expressed; a small brownish-white area also within the cell at the distal end; the pseudoneura very distinct; the fringe-lunules brownish-white.

Posterior wings with the discal yellow area occupying one third of its extent, followed by a band of 5 conical large black marks, and a row of adnervular yellow cuneiform marks, the outer submarginal part of the wing being a dark brown united to the black cones; 3-4ths of the cell is yellow, the area between the median and its 3rd branch and the submedian is yellow-scaled and subdued into brown by scales or atoms. The abdominal margin is rufous brown. The under surface of both wings similar to the upper, except that the light marks on the anterior wings are nearly white and more definite, and the two adnervular rays of the 4th and 5th subcostal nervules are only indicated by white atoms; that the discal and discocellular areas are yellow white instead of yellow, and the submarginal yellow spots are not subdued by scaling as above; there is also a white fringe-line at the apical angle, and a faint white spot at the anal angle.

Head, antennæ and thorax black; pronotal collar red; abdomen light brown; underside of thorax with red pectoral patch on each side as usual; underside of abdomen yellow, dotted with brown atoms, and first 3 segments from the base dark brown.

Length of costa 76, of outer margin 53, and inner margin 43 mms.; of posterior wing 50 mms.; greatest width 35 mms.

Length of abdomen or antennæ 28, of thorax and head 21 mms.

Length of Legs { 1st pair: femur, 10; tibia, 8; tarsi, 13 mms. / 2nd ,, : ,, 12; ,, 10; ,, 16 ,, / 3rd ,, : ,, 13; ,, 12; ,, 17 ,, including the trochanters.

The outline of the anterior margin of the ♀ is considerably concave, in the ♂ rather less so.

Habitat, W. Java ♂, S. Java ♀.

My figures and descriptions of this species are from specimens in the Tring Museum.

POMPEOPTERA AMPHRYSUS, var. *Sumatranus.*

Ornithoptera Sumatranus, Hagen, "Iris," Vol. VII., p. 14, n. 5. (1894).
Troides Amphrysus Sumatranus, Rothschild, "Novit. Zool. Vol. II., p. 232, n. 25, d. (1895).
Pompeoptera Amphrysus, var. *Sumatranus,* Rippon, Section TROIDES, p. 13, in Wytsman's "Genera Insectorum." (1902).

♂. Anterior wings velvety-black; the adnervular rays golden-yellow, but only very slightly shewn, being little more than a few short streaks of yellow scales, and these very faintly indicated on the lower part of the disc; a very contracted yellow group of scales in the cell, on the upper half of the discal end; also slight streaks of yellow scales along part of the costal and subcostal nervures; the veins slightly rufous brown. Undersurface almost entirely as above; the fringe lunations of the outer margin white.

Posterior wings a rich golden yellow, with dull green reflections, or opalescence; the scalloped or dentated, margin is, like that of the type form, narrowly black and graceful, extending as a long black mark half-way up by the 3rd median nervure; the costal margin, a small basal portion within the cell, the submedian area and the abdominal fold concealing the *androconia* are deep velvety-black; a few long black hairs flow down from the median vein over the yellow; and a few minute black atoms are grouped on the yellow disc between the 1st and 2nd discoidal nervule. The character and colour (nearly a flesh tint) of the *androconia* (as shewn in my plate fig. 1.), is similar to the prevailing tint of the abdomen.

Undersurface as above, with a thin line of dark atoms parallel to the black from the apical angle; from the submedian nervure a line of rufous fringe-hairs proceed, and partly covers the sides of the abdomen when the insect is at rest.

Thorax, head and antennæ velvety-black; eyes dark rufous brown; beneath, black, with red pectoral patches and red pronotum.

Abdomen fleshy red-brown, with a rather darker dorsal longitudinal stripe; each side of the lighter part of the abdomen is margined by black, with yellow outline; the upper part of the anal valves black; the sides and subdorsum yellow and yellow-green, with the usual lateral rows of black dots; anal valves flesh-coloured.

Length of costa 74, outer margin 54, and inner margin 41 mms. Greatest length of posterior wing 45, and width 33 mms.

Length of abdomen or antennæ 29, and of head and thorax 23 mms.

Length of Legs { 1st pair: femur, 9; tibia, 7; tarsi, 10 mms.
2nd ,, : ,, 11; ,, 11; ,, 14 ,,
3rd ,, : ,, 11; ,, 11; ,, 14 ,,
including the trochanters.

Hab. Karo, Sumatra.

♀. Anterior wings dark rufous brown; the adnervular rays from the 2nd subcostal nervule to the 1st median nervule sordid yellow-white and long; all below of the same colour, short, variable in length and shape, beginning at more than half way from the median vein, or nearest to the outer margin, and subcuneiform; the mark within the cell irregular in shape at the distal 5th of the cell, and sordid whitish-yellow.

Undersurface as above, but the light marks are a purer and brighter whitish-yellow, and nearly all are margined with light yellow atoms. The fringe lunules white.

Posterior wing with yellow disc, and the distal half of cell yellow; a band of 6 large suborbicular black discal spots, followed by a scalloped submarginal band of yellow; the broad outer-marginal band is densely black and lunated; fringe lunules whiter; the base, costa, basal half of the cell and abdominal margin black, but the submedian area is deeply rufous with a line of light yellow atoms; the black edge of the submedian sinus is powdered with greenish and black atoms on the yellow; the submarginal yellow band is also subdued by black atoms; the abdominal margin is irrorated by yellow scales; abdominal fringe black, a mass of delicate dark hairs proceeds from the base into the yellow of the cell, and lower part of the yellow disc.

Undersurface as above, except that the yellow areas are not subdued by black atoms, only one narrow streak of yellow atoms is on the abdominal margin, there are no dark hairs proceeding from the base into the yellow, one rather small black ovoid spot follows the band of 6 large black maculæ below the 3rd median nervule, and all the maculæ and the inner lunate edges of the outer-marginal black band are slightly powdered with grey atoms.

Head, antennæ, eyes, and thorax black; abdomen very dark brown; underside of thorax black-brown; legs blacker; no red pronotum or pectoral red marks. Abdomen beneath yellow, with the usual row of lateral black dots; the segmental incisures well defined.

Length of costa 76, of outer margin 60, and inner margin 55 mms.; length of posterior wing 55, and width 40 mms.

Length of abdomen 30, of antennæ 26, and of thorax with the head 23mms.

Length of legs { 1st pair: femur, 11; tibia, 8; tarsi, 12 mms.
2nd ,, : ,, 12; ,, 12; ,, 15 ,,
3rd ,, : ,, 12; ,, 12; ,, 16 ,,
including the trochanters.

Hab. Battak Mountains, E. Sumatra.

The originals of these descriptions and figures are in the Tring Museum.

The ♂ of this form in its general colouration and appearance wonderfully resembles the ♂ of *P. cuneatus* of Oberthür from W. Java, except in the omission of the beautiful discal row of cuneiform black marks on the posterior wings of that species.

POMPEOPTERA AMPHRYSUS, var. *Cuneifera.*

Ornithoptera cuneifera, Oberthür, "Études d'Ent." IV., p. 110, sub. n. 9 (1879). ♂
Papilio (Ornithoptera) Ritsemæ, Snellen, "Notes Leyden Museum," p. 153 (1889). ♂ ♀.
Troides Amphrysus cuneifer, Rothschild, "Novit. Zool." Vol. II., p. 229, n. 25 (*b*). (1895).
Pompeoptera cuneifera (or cuneatus?) Rippon. in Wytsman's "Genera Insectorum, sec. TROIDES." p. 14 (1902).

I first give M. Oberthür's original description of this variety of *Amphrysus*, which was published in his "Études d'Entomologie," in 1879. The description applies only to the ♂. It was reserved for Mr. Snellen to describe the ♀ later on under the name of *Ritsemæ*.

"Tres cureiux Papillon, beaucoup plus petit que les individus ordinaires d'*Amphrysius*, ayant le contour extérieur des ailes inférieures plus profund, les parties saillantes plus argues et les nervure peu courbées près de l'extrémité. De plus, dans la partie jaune de l' aile inférieure, entre les nervures, on voit cinq taches noires triangulaires; la quatriême surtout est très grosse. Sur les dessus de l'abdomen, deux taches noires soyenses se detachent sur le fond fauve pâle." (Catalogue Raisonne de Papilionidæ de la coll. de Ch. Oberthür).

♂. Anterior wings velvety black, with the adnervular rays and the subcostal veins a rich silky yellow. These rays only extend to the 2nd median nervule, whose particular ray forms only a small yellow pyriform spot; fringe-lunules white; a thin yellow line borders the distal end of the cell; all the yellow rays are subdued by black atoms; the veins are all fairly prominent above the black. Undersurface almost exactly as above, with the addition of 2 faint yellow marks below the rays. Posterior wings rich golden yellow, suffused on the disc and at the distal end of the cell by an emerald green tinge; the veins all vividly black; the outer marginal black band is rather narrow, and sinuate or dentate, with a rather long pointed dentation at the anal angle; the abdominal or inner margin is broadly black, and there are 4 black cuneiform marks between the veins of the disc, of which the 2nd from above is the longest; these are elegant in form, and dotted with yellow atoms. Undersurface as above, except that the intra-venal cuneiform marks are rather smaller, and the 1st subcostal nervule is thickened in a black mark towards the outer margin, the base is black, the black marginal dentation at the anal angle is as short as the others, and the broad abdominal fold is reddish-brown; fringe-lunules white; abdominal fringe of long hairs red.

Head, antennæ and thorax black; eyes brown; pronotal collar red; abdomen pale fawn colour, silky, with 2 dorsal black, nearly rounded, spots; the anal segment with black dorsal triangulate mark: abdomen beneath and on the sides greenish and golden yellow, with the usual lateral row of black dots, and the incisures black; anal valves fawn colour; thorax beneath black, with the pectoral red patch; legs black.

Length of costa of anterior wing 67, of outer margin 50, and inner margin 40 mms.; width of posterior wing 32, and length 39 mms. Length of abdomen or antennæ 26, and of thorax with head 20 mms.

Length of Legs	1st pair:	femur, 10;	tibia, 9;	tarsi, 11 mms.
	2nd ,, :	,, 10;	,, 11;	,, 13 ,,
	3rd ,, :	,, 9;	,, 11;	,, 14 ,,

Habitat: W. Java.

♀. Anterior wings, fuscous brown; the adnervular rays creamy-white, with brown scaling; these rays commence at the 1st median nervule, the initial rays being broad, and the others becoming narrower till they become at the costa thin streaks of white; in length they nearly reach the outer margin of the wing at near the apical angle; from the second median nervule to the submedian nervure are also four short rays or light marks, varying a little in size and shape, with a slightly sordid yellow tinge; 1-4th of the discoidal cell at the distal end is also creamy-white, subdued by brown scaling; the fringe-lunules are thin and white. Undersurface as above, except that the adnervular rays are purer, and the short rays or marks are more yellow and five in number; the pseudoneura, except the central one, are almost invisible.

Posterior wing: the cell diagonally and narrowly fuscous brown from the base, followed by a creamy-white patch in nearly 3-4ths of the cell, subdued by brown scaling, and a yellow area of 1-4th at the distal end; outside the cell from the 1st subcostal to the outer half of the 2nd median nervure is a narrow area of yellow, sinuate or lunate in the outer direction; the remaining half of the space between the 2nd and 3rd median branches and to the submedian fold or sinus is creamy-white, subdued towards the base, and reaching longitudinally down 2-3rds of that part of the wing; the abdominal marginal area is fuscous brown; the discal area of the wing is black, with a submarginal group or band of small disconnected and triangulate or cuneiform yellow marks, 12 in number, and a thin streak of white atoms at the apical angle; the fringe-lunules are prominent and white. Undersurface nearly as above, but the yellow and light areas are only slightly scaled at the base of the cell, and are shaded into the yellow; the submarginal band of yellow marks are 9 in number, of which the first two are sublunate, between the costal and 2nd subcostal veins, the 3rd and 4th between the 2nd subcostal and discoidal veins, the 5th is attached to the discoidal vein, the 6th and 7th are double sized and cuneiform to the 1st and 2nd submedian, and the 8th and 9th—the latter a long yellow mark at the anal angle—to the 3rd median branch; there are also 2 submarginal white marks of atoms united to the fringe lunules of the lower part of the wing; a brief line of yellow atoms is also at the costa.

Head, antennæ and thorax black; eyes brown; dorsum of abdomen fuscous brown; pronotal collar red. Underside of thorax dark brown with the pectoral red spots; legs black; abdomen, subdorsum and sides greenish yellow, with the usual black dots—the segmental incisures brown.

Length of costa 80, of outer margin 59, and inner margin about 45 mms.; length of posterior wing 56, and width 44 mms.

Length of abdomen or antennæ 28, of thorax with head 21 mms.

Length of legs { 1st pair: femur 8; tibia, 8; tarsi, 12 mms.
2nd ,, : ,, 11; ,, 12; ,, 18 ,,
3rd ,, : ,, 11; ,, 12; ,. 16 ,,
including the trochanters.

Habitat, W. Java. This species or variety inhabits Mount Gede, according to Frühstorfer, at an altitude of 6,000 feet.

The posterior wings of the ♂ are distinguished from the typical *Amphrysus* and its varieties most effectually by the beautiful group of cuneiform black marks on the yellow disc. It appears also to be a smaller form than either of those, in both sexes.

The originals of my descriptions or figs. are in the museum of the Hon. W. Rothschild, at Tring; and the original type of *cuneifera* is in the collection of Mr. Oberthür at Rennes.

RECAPITULATION OF THE PRINCIPAL CHARACTERS OF THE AMPHRYSUS GROUP.*

A comparison of the different forms of the Amphrysus group will give us the following results, by which we may be able to judge of their relationship to each other.

(*a*). The type species *Amphrysus* ♂ with velvety black anterior wings, and all the adnervular rays and marks in both surfaces, yellow; the fringe lunules on both surfaces yellow; all yellow marks very prominent. Posterior wings yellow, with moderately broad black lunate border; without black maculæ, except one elongate spot at the anal angle united with and above the marginal lunation or dentation (on the under surface of the wing this mark is only faintly indicated by black atoms or scaling); the inner or abdominal marginal fold is broad and black above, partly rufous on the underside; abdominal fringe, rufous. Undersurface of wing, similar. Head, antennæ and thorax, black; pronotal collar red; abdomen, greenish yellow, with a broad central longitudinal black and rufous vitta above.

♀. Anterior wings on both surfaces, rufous brown; with sordid white and yellow discal rays, and the distal end of the cell sordid white; on the undersurface the light areas are yellow white; fringe lunules white. Posterior wings, 2-3rd of the cell and 1-3rd of the disc, yellow; base of the wing and subcostal area, rufous brown; outer 2-3rds of the disc black, with a row of yellow marks midway; the submedian area, rufous brown, and above the submedian fold very sordid brown yellow; fringe lunules, white; abdominal fringe, rufous or burnt sienna. The undersurface of the wing as above, except that the yellow area is whitish yellow. Head, eyes, antennæ and thorax as in the ♂; abdomen, rufous brown above; yellow below.

(*b*). var. *Ruficollis*. ♂. Anterior wings black; the adnervular rays and cell marks (at distal end) faintly orange yellow and white, and not so prominent as in the type form; fringe lunules, white, being only thin outlines; undersurface the same. Posterior wings, rich silky golden yellow, with the outer marginal outline black, with the submarginal row of black lunations situated midway from each vein; an elongate black spot at the anal angle; the base of wing, rufous above the precostal cell; the veins rather curved, thin, black, and very graceful. Undersurface similar; inner margin, sienna brown on both surfaces; abdominal fringe, black. Head, antennæ and thorax, black; eyes, red brown; pronotal collar, red; abdomen, greenish lemon-yellow, with fleshy pink dorsal vitta, and white anal valves.

(*c*). Sub. var. *Flavicollis* ♂. Anterior wings, black; all the yellow rays and marks yellow, with white terminals and prominent; outer marginal fringe lunules thin and white. Posterior wings and abdomen as in *Ruficollis*: head, eyes, antennæ and thorax the same as in *Ruficollis*, except that the pronotal collar is yellow instead of red. ♀. Anterior wings, pale amber brown, and brownish-grey cell, shaded darker towards its base. The undersurface similar. Posterior wings with the cell, costa, and outer area of median and other veins, yellow; the disc is occupied with black to 3-5ths of its area, and contains a submarginal band of yellow marks; the base of wing, fumous brown, as is the abdominal area. Undersurface similar; abdominal fringe short and dark; head, eyes, thorax, &c., and collar, as in the ♂; colour of abdomen as in the ♂.

The ♀ ♀ of *Ruficollis* and *Flavicollis* differ from those of the type form in having the costa of the anterior wings rather more pointed at the apical angle, and in the very different appearance of the vars of submarginal lunate spots of the posterior wings. The ♀ of *Flavicollis* bears rather a striking resemblance to the ♀ of *Andromache*.

(*d*). var. *Cuneifera*. ♀. Anterior wings, silky black; the light rays and marks, yellow, subdued by black atoms; undersurface the same. Posterior wings, rich silky yellow, with lemon-green shading and reflections; a discal row of four cuneiform black marks; outer marginal band broadly black and sinuate; at the anal angle the black division is sharply dentate, but only faintly shown on the undersurface; base of wing, dark brown; abdominal area black; fringe lunules white (on both wings); abdominal fringe, burnt sienna-red. Head, thorax, &c., as in the type form; pronotal collar, red; abdomen, rufous brown above; with lateral yellow outline and two dorsal black spots; anal valves, grey and black; underside of thorax with lateral red patches; of abdomen, yellow green; undersurface of wings as above. ♀. Anterior wings, rufous brown, with greyish-ochraceous broad rays, and yellow marks; distal end of cell broadly grey. Undersurface similar, but the light parts are purer in colour. Posterior wings with the greater portion of the disc black, and a submarginal band of small yellow marks; the distal end of the cell and a small portion of the disc yellow; the remainder of the cell and disc grey, subdued by scaling; tho base of wing and subcosta, and inner marginal area, rufous brown; fringe lunations conspicuous and ochraceous-grey; abdominal fringe, burnt-sienna. Undersurface of wings nearly as above, the lighter parts purer in colour, with congeries of white atoms. Head and thorax, &c., as in the ♂; abdomen, brown above, greenish yellow beneath.

(*e*). var. *Sumatrana*. ♂. Anterior wings rather narrower and longer than in the other forms; black, with only faint indications of the yellow rays and marks; undersurface as above. Posterior wings yellow, shaded with lemon green, and exceedingly like the wings of *Cuneifera* except in the absence of the cuneiform marks; undersurface as above, except that the abdominal marginal fringe is very whitish red. Head, thorax, &c., like the other form, but with no visible red collar above, but with red pectoral patches; abdomen, very rufous or flesh-coloured grey, with lateral large spots, black dots, flesh-coloured anal valves; underside, yellow and greenish. ♀ [A bold, strong-loooking insect.] Anterior wings, warm dark brown; with all the rays and marks sordid yellow grey; undersurface of wings, warm dark brown, the yellow marks all brighter and a purer yellow. Posterior wings with yellow disc and the distal half of the cell yellow; a band of suborbicular black spots, followed by a scalloped submarginal band of yellow; the remainder of the wing velvety black; the abdominal marginal area rufous, with yellow atoms; undersurface, similar. Head, thorax, &c., black on both sides; abdomen, dark brown above, yellow beneath. Thorax, with no pectoral red patches.

(*f*). var. *Palabuana*, Frühstorfer, from Palabuan, S. W. Java, anterior wing of the ♂ with the adnervular rays almost dark reddish-brown.

(*g*). var. *Olympia* ♀, Honrath, from S. E. Borneo, is only a slight variety of *Flavicollis*.

*By a miscalculation in paging, this article is, unfortunately, misplaced; it should have been on page 51, before the article on *P. Nereis*.

POMPEOPTERA AMPHRYSUS.

VARIETY, *FLAVICOLLIS.*

Ornithoptera flavicollis, Druce, Proc. Zool. Soc. 1873, p. 356. (No figure.)
Troides Amphrysus, abr. (c) Flavicollis, Walter Rothschild, Novitates Zoologicæ, n. 25, p. 231, Vol. II. (1895).

Mr. S. B. J. Skertchly, in the Annals and Magazine of Natural History, 6th series, Vol. IV., p. 210, in his paper on "The Habits of Certain Bornean Butterflies," speaks of *O. flavicollis* as very common at one place on the river Tinkyo, where he camped all May, 1888. This var. according to the same authority is one of the earliest butterflies on the wing in those wonderful forests in Borneo, so that it evidently makes a long day. The earliest butterflies do not begin to fly before 7 a.m., and *Ruficollis* is one of them; he retires latest also, does not trouble himself about cloudy weather as is the manner of some butterflies, and cares little about a shower of rain, though he does not carry an umbrella—an indifference which would certainly make a collector's mouth water and his heart rejoice, if it were common to all lepidoptera when *he* was on the war path! The *Hestias* and some others of the *Danainæ* though they rise nearly as early, and are nearly as restless or industrious, are not quite as enterprising or brave, for Skertchly tells us they may be seen, during cloud and rain, "pitched, often on an exposed shrub, where, with folded wings, they patiently get wet;" a habit possibly like that of the ass in standing with his back to the storm while the pelting rain comes down, looking very miserable, but probably under the impression that he is keeping himself dry, or at any rate as dry as possible under the circumstances.

This var. of *Amphrysus* or *Amphrisius* is evidently very common, as far as the ♂ ♂ are concerned; for a great number must have reached our collections. Of the ♀ ♀ so much perhaps cannot be said.

Mr. H. Druce, in the proceedings quoted at the head of this article thus describes *Flavicollis*, giving it specific rank:—

"♂. Upper side: Similar to *O. Amphrysus* from Java, but differs in the following respects: Anterior wing more elongated, with the yellow markings at the end of the cell smaller; the posterior wing rather paler in colour, with the black scallops and the black border much narrower. It is at once distinguished from all other species by its bright yellow collar. The neuration of the posterior wing differs slightly from *O. Amphrysus*.

"♀. Anterior wing sooty black, with all the veins broadly bordered with dusky white; the marginal series of black spots on the posterior wing are much broader than in *Amphrysus*, almost reaching the discoidal cell; very like the posterior wing of *O. Miranda*, Butler.

"I have examined 35 ♂ ♂ and ♀ ♀ of this species, and they do not differ in any respect. Hab. Borneo. In the colls. of H. Druce and O. Salvin."

In the Plate [Pl. 51] illustrative of this variety, I have given (figs. 3, 4, 5), portraits of the two sexes, and also (figs. 1, 2) of the variety *ruficollis* ♂ of Butler. The latter var. is placed first, as it appears to diverge least from the typical or parent form *Amphrysus*, as may be seen by a careful comparison. In the females of *ruficollis* I find little or no difference except in the colour of the collar, but in *flavicollis* there are undoubtedly important differences, while the ♀ here figured is so unlike in many details even the accepted form that it might ultimately merit a new varietal name, if we were able to find a male to match with it.

♂. (Fig. 3). Anterior wings velvety black, with rich golden lemon-yellow rays, greyish towards the outer margin, within which are the chief nervules; these reach to within a short distance of the outer margin; the upper part of the cell, with part of the costa, of the same colour, forming altogether an elongated oblique patch midway of the upper part of the wings; this encloses the black nervures (very broadly black), and the 1st and 2nd pseudoneura, and an elongate cloud of black atoms within the cell.

Posterior wings intense silky yellow, more golden at the hind margin, greener at the base. Wings delicately scalloped or curved, with black incurved marginal spots, a black marginal line, and an elongate black spot twice the length between the 2nd and 3rd median nervules, with yellow atoms dividing it midway; the base brown; abdominal fold brown, with pearly kid-white on inner edge, and a brown line to complete the shape of the fold.

Abdomen primrose yellow, with a fleshy pale brown dorsal stripe to within the 2nd anal segment; subdorsum slightly orange yellow: lateral dots minute; anal valves with two sharp crossed spine-like points, soft fawn greyish white, with a slight black outline above. Thorax, on the under sides with only a small patch of red near the base of the wings: pronotal collar yellow, nearly ∽ shaped.

The yellow of both surfaces of the wings shot with green. The pseudoneura are prominent on the under side of the anterior wings. The veins of all the wings very black and exquisitely curved. Some of those of the posterior wings curve round at the exterior margin, and become a part of its thin black border.

Length of costa 78, width of anterior wing 41, length of posterior wing 48, and width 36 mm.; of abdomen or antennæ 31, thorax with head 12 mm.; width of thorax 12, of abdomen 12 mm.;

of legs { 1st pair: femur, 11; tibia, 9; tarsi, 15 mm.
2nd ,, ,, 12; ,, 12; ,, 15 ,,
3rd ,, ,, 11; , 12; ,, 15?,, ;

width of abdominal fold 5 mm., length 25 mm. Hab. Borneo.

♀. Anterior wings, pale umber brown, with brownish grey rays and marks; within the cell the same grey, graduated from pale brown at the base to the purer grey at the discocellular nervules and beyond, the effect being produced by graduated brown atoms, the Pseudoneura quite prominent. Under surfaces similar, except that the brown

and grey are more pure, from the absence of the atoms, and the Pseudoneura are well marked.

Posterior wings less intense lemon yellow; the very broad dark-brown margin nearly reaching the discoidal cell in the 3 lower divisions, which are also more pointed than are the 3 superior; the yellow spots enclosed by this form a very regular submarginal band, the 3 inner ones dusted with black atoms. The dark brown altogether occupies about 3-5ths of the wing area, and the yellow near the base is furnished with delicate, almost invisible brown hairs. The base is warm brown. The abdominal fold within the submedian nervure is pale fawn-brown, darker nearer the inner margin. Under surface, pale primrose yellow; and very dark sepia brown; abdominal fold pale brown with a very short fringe.

Outline of posterior wings dentated, with white lunar spots above, fawn-coloured below.

The different divisions of the subcostal nervure larger than those in the PRIAMUS group.

Eyes chesnut brown; femora with yellow scales over nearly their entire length.

Abdomen: dorsum fawn-brown, with lateral border of yellowish grey; subdorsum lemon yellow with lateral black dots. Thorax: smoky brown above, lighter below: sides with a slight spot of red. Collar orange yellow.

Length of costa of upper wing 85, width of wing 47, length of under wing 57, width 40 mm.; length of abdomen and antennæ 30, width of thorax 10, of abdomen 10, length of thorax with head 21 mm.

Of legs { 1st pair: femur, 12; tibia, 8; tarsi, 13 mm.
2nd ,, ,, 13; ,, 11; ,, 12 ,,
3rd ,, ,, 12; ,, 11; ,, 16 ,,

Hab. Borneo.

I am indebted to the kindness of Mr. Frederick Moore for the privilege of figuring and describing these specimens, from his splendid Indian collection.

♂. In the British Museum. Body more than usually robust, same size as that described above; orange yellow on upper wings extends exactly as in the *var.* ruficollis, that is, less than half the length, so that Mr. Moore's examples are *subvarieties* of Druce's var. No other difference. Hab. Borneo.

♀. Brit. Museum. Length of costa 87 mm. One tear-shaped spot in the cell close to the discocellular nervule, its apex pointed inwards. The pseudoneura faintly represented. Under wings black, with their marks more gracefully formed than in Mr. Moore's specimen. Hab. Borneo.

♀. Brit. Museum. Length of costa 94 mm. Altogether more robust than the above; the grey of the wings slightly more drab coloured. Hab. Borneo.

In Plate 10 and fig. 4, vol. I., of this work is a representation of the under wing of a var. of the ♀ in the Brit. Museum. Hab. Borneo. The shape of the yellow collar is ⌣.

POMPEOPTERA AMPHRYSUS.

VARIETY, *RUFICOLLIS.*

Ornithoptera ruficollis, Butler, Trans. Linn. Soc., 2nd Ser. Vol. I., p. 552. (1875.)
,, ,, Distant, Rhopal, Malayana, V. I., t. 328-30 with plain fig., V. II., p. xxvii., a. 1. (1871.)
,, ,, Fickert, Ueber die Zeichn. der, Gatt. Orn., p. 739. (1888.)
Troides Amphrysus, abr. (d), ruficollis, Walter Rothschild, Novit. Zoologicæ, n. 25, p. 232, Vol. II. (1893.)

♂. Described by Butler. "Allied to *O. Flavicollis*: wings smaller, comparatively narrower; outer margin of Primaries more distinctly inarched. Collar carmine. Expanse of wings 5 inches 4 lines to 6-1. ♂. Malacca."

[The inarching of the outer margin is not absent in *Flavicollis*, but in some examples quite as prominent.]

♀. Described by Distant. "Anterior wings above blackish, with the following greyish markings:—2 large contiguous spots at the end of the cell, the area above and beyond the apex of the cell elongately continued along the nervules, and a spot near the apex of 2nd and 3rd median nervules and of submedian nervure. Posterior wings above very bright pale yellow; the neuration, a large basal transverse patch extending from base of cell to costal margin beneath the costal nervure, the abdominal margin, and the posterior margin inwardly scalloped and connected with a submarginal series of 6 larger spots placed between the nervules, the 3 uppermost of which are irregularly rounded, the 4th, 5th, and 6th pyriform, black, near the abdominal fold and above the submedian nervure the ground colour is dusted with dark greyish scales beneath as above, but the greyish markings on the anterior wings paler beneath, and the posterior wings not dusted with dark greyish near the abdominal margin. Body above, with the head and pronotum black, the last with a narrow carmine collar; abdomen above greyish brown; abdomen beneath with about half of its lateral margin bright yellow; thorax beneath and legs black."

Plain figs. of both surfaces given by Mr. Distant on page 329 of his work, differ little from the *var.* sketched from the Brit. Museum.

Relative to "Var. ♀ Pl. xxvii. a 1," he remarks, "this variety differs from the typical form by having the submarginal row of spots to the posterior wings distinctly separated from the posterior margin."

In my Plate (51, figs. 1, 2), I present portraits of the upper and under sides of the ♂ from an example in my own collection. All that need be said about it is that it differs only in the slightest degree from examples of *Flavicollis* which I possess, except that the red collar is wider than the yellow

one, the yellow of the under wings is warmer than in *Flavicollis*, and the apex of the upper wings more rounded. One small specimen of *Flavicollis* has the apex sharply pointed. Hab. Borneo.

♂. In Brit. Museum. Agrees in every respect with the *Flavicollis* figured in my plate, except in the presence of a minute yellow line on the subcostal vein, and that the yellow of the cell and costa does not extend so far inwards—little more than 1-3rd. Length of costa 84 mm. Hab. Malacca.

♂. Brit. Museum. Yellow of Primaries generally redder. Length of costa 54 mm. Hab. Malacca. Another ♂ in same collection has the yellow of Primaries orange tinted. A ♂ from Penang, costal length 75 mm., presents no other difference. There is no ♀ of this variety in the Brit. Museum at present.

These are certainly only local varieties of *P. Amphrisius:* the greatest differences being that in the ♂♂ the yellow of the upper wings is much more broadly marked both within and without the cell, but in no one is the yellow within the cell carried so far as in the fig. in our plate—not above 1-3rd. In the ♀ upper wings the grey stripes and patch close within the cell are almost of the same shape and extent as in the ♂, differing therefore greatly from the figure, and from the ♀ of *Flavicollis*. The same may be said of the under side.

There are 2 ♂♂ in the Brit. Museum most near to *Ruficollis*, with red collar, and exceedingly rich green-yellow under wings. The markings of the Primaries are only faint stripes, and there is the faintest indication of yellow on the discoidal cell, and between the nervures of the costa. These will have to be considered later on as a new variety. A ♀ also appears to belong to it from the same locality in Borneo (20 miles up the Sundu river, near the Lymbang), differing from the ♀ of *P. Amphrysius*.

Reverting once more to the interesting paper of Mr. Skertchley, in the Annals and Mag. of Nat. Hist., vol. iv., p. 218, we find him saying, in connection with the variety *flavicollis*.

"The ♂ has one peculiarity in flight which may be used in courting, and is certainly used on other occasions. In basking among the foliage on sunny riversides, it often flies slowly along moving only its forewings, the hind wings drooping at an obtuse angle to the line of flight, trailing like a rich robe of golden silk. In a freshly caught specimen this position can be easily induced. A furrow in the inner margin of the ♀ wing allows the notch of the h. w. to be elevated easily without interfering with the partial action of the f. w. In such flight the f. wings only move through a small angle. On the inner margin of the h. w. there is a strong fold fringed with hairs, forming a pouch. In normal flight and when at rest this pouch is closed, but when the h. w. is drooped the pouch opens. It may therefore be a scent pouch, and this particular flight the normal courting flight."

Skertchly does not mention the peculiar contents of the pouch, or say whether any portion of the cottony material was dissipated after the flight. It would be interesting to know.

In our plate, fig. 2*a*, will be found a sketch of the ♂ anal valves of *ruficollis* drawn as it appears when quite closed, from a specimen in the author's museum.

POMPEOPTERA NEREIS.

Ornithoptera Nereis, William Doherty, Journal Asiatic Soc. Bengal, Vol. lx., Pt. II., No. 1., 1890, p. 30

This species occurs on an island situated about 80 miles west of Sumatra, called *Engano*. A long line of islands and islets, forming several obvious groups, extends from the great Nicobar island, and chief of the group of that name (that is north of the equator, with a positive west of Sumatra), down to the equator, including in its course the Cocos, Hog, Baniak, and Nias groups of islands; then south of the equator we find Mintaon, Sebeeroo, Sepora, Poggy, Nassau, and lastly *Engano*. The latter is 180 miles south of the Nias group, and 210 miles from Java, being situated north of that great island. A considerable portion of this long line of islands is usually included in what are called the Sunda Islands, of which we might almost say Sumatra itself is the monarch—being separated only from Java by the Straits of Sunda. Mr. Doherty tell us that *Engano* is wholly surrounded by deep sea, with a coast protected by its extensive coral reefs from the agencies which are gradually wearing away the other islands. He says "the deep sea that surrounds them swallows up all the alluvium from their streams;" and "the tremendous surf on their western shore steadily undermines their hills, and under this process the islands have long been wearing away." How much this process is delayed or modified by the stupendous volcanic agency, always more or less at work in Sumatra, Java, and the Straits, it would be difficult to say, but this influence must be very great in any case.

Zoologically Engano is considered by Doherty to be an outlying member of the Nias group, with Javan affinities, and an area of about 120 square miles. It is called Pulo Telanjang, or the Naked Island, by the Malays, because the inhabitants till recently went about in a nude condition.

The description of the island by Mr. Doherty is very interesting; and to this, with what the writer in the *Tidschrift van Nederlandsch Indië*, or the Journal of the Dutch Indies, says about its people and products, I refer the reader for further information. Mr. Doherty obtained about 10 species of land shells, most of them new, on the island, and only a small collection of Lepidoptera and Coleoptera, in the former of which it would seem there were relatively more butterflies than moths, while among

the beetles the *Elateridæ* were dominant, and the *Phytophaga* very rare. No species of *Cassida* was taken at all; frogs, toads, snakes, and lizards abound; but he says nothing about the birds, or the higher vertebrata. He collected 50 species of butterflies, and saw two or three more. Of these he felt justified in considering 13 to be new, including nearly all the *Danaidæ*, and three species of *Papilionidæ*, reckoning the Ornithoptera as one. The following are Mr. Doherty's descriptions of *P. Nereis*, to whch are added my own additional observations on his types and co-types, from which the figures in the plate are drawn :—

" ♂. Above black, the cell immaculate, the veins of the disc black, bordered with rather conspicuous whitish rays. Hind wing golden yellow, bordered with a deeply scalloped black band, which is only about 1-10th of an inch wide at the ends of the veins, the base black above the middle of the costal space, including the root of the cell; two (in one specimen five) black discal spots subanally in the gold below, the white streaks near the veins are more continuous, and the end of the cell is slightly touched with whitish; a little red at the base of the wings."

[The inner subanal spot is 3 or 4 times the size of the outer, and on the underside of the wing where they are repeated they are slightly larger. The under surfaces of the wings are in all respects like those above with the exception that the golden yellow of the secondaries is more lemon in intensity, and that the space between the 3rd median nervule and submedian nervure contains a rather large black spot, separated from the brown that occupies part of the space by golden yellow atoms, with an elongate spot close to the anal angle, also divided by golden scales or atoms. The sexual pouch is silky olive black above, brown black below, with brown black abdominal fringe.]

" ♀. With the outer third of the cell entirely dull whitish the whitish streaks between the veins coalescing, and extending nearly to the outer margins, the black rays in the middle of the spaces not nearly reaching the cell; hind wing very dull golden, the border wide, the discal spots coalescing widely with each other and with the outer black band, so as to enclose small yellowish lanceolate spots in pairs, divided by the veins. *Below*, the hind wing is dull pale whitish-yellow, without any golden tint; this area extends only to the upper subcostal vein, and occupies 2-3rds of the cell. Several males and two females were taken, but one of the latter was unluckily destroyed, and the other is worn."

On the Primaries the white between the veins is not so much modified by dark dustings of scales as in other species, and is very closely copied on the under surface of the wings. The yellow of the secondaries is within the cell, between the 1st and 2nd subcostal nervules, a small portion of the space close to the 3rd median nervules, and between that and the submedian nervure, more or less whitish like the under surface. A streak of whitish and dustings of whitish scales are also found on the abdominal fold.

The opaque white of the under surface of the hind wings distinguishes this form from all others in the Pompæus group. The affinity of this species is with *P. minos*, of Southern India.

There are six specimens of this species in the collection of the Hon. Walter Rothschild, all that were collected, five of them ♂♂ and one ♀, including the two types. I have numbered these specimens for future reference.

Nos. 1 and 2 have only one subanal black spot on the upper side, and two on the underside: the outer one being a mere dot, which can be seen from the upper side in certain lights. No. 3 has three black spots on the underside of the right wing, and two on the left: the larger, inner one, is repeated on the upper surface, and faint clouded indications of the others are visible. The space between the submedian nervure and 3rd median nervule contains two black spots also, the upper one surrounded by black scattered scales on a whitish yellow ground.

No. 4, which I have figured in the plate, will speak for itself (fig. 3), as will No. 5 the type. No. 6 (the ♀) also is fully represented in the plate.

♂. Head : eyes chesnut black, articulations of antennæ 48. Abdomen : the dorsal brown black, enclosing a longitudinal stripe or patch on three of the segments of a red fawn colour; the lateral lemon yellow; subdorsal redder lemon. Five lateral subdorsal black dots, obscurely represented. Anal valves delicate fawn colour. *Pseudoneura* fairly prominent in the discoidal cell of the upper wings.

Length of costa, 67 mms.; antennæ and abdomen, 28 mms.; thorax with head, 19 mms.; width of primaries, 36 mms.; of hind wing, 31, and length, 42 mms.

No. 1 ♂, Length of costa, 72; of No. 2 ♂, 68; of No. 3 ♂, 71; and of var. ♂, 67 mms.

♀. Head : eyes chesnut black. Articulations of antennæ, 46 mms. Thorax and abdomen smoky brown; lateral parts of the latter a sordid yellow with five black dots, and of subdorsal yellow. Anal tuft reddish brown.

Length of costa, 82 mms.; of antennæ and abdomen, 28 mms.; thorax with head, 20 mms.; width of primaries, each, 41 mms.; of secondaries, 39 mms.; and length, 55 mms.

Legs ♂	1st pair	femur,	11;	tibia,	7;	tarsi,	11	mms.
	2nd ,,	,,	10;	,,	12;	,,	15	,,
	3rd ,,	,,	10;	,,	10;	,,	15	,,

In the ♀ the legs are so broken away that no measurements are possible.

Hab. Engano.

I am indebted to the Hon. L. Walter Rothschild for the pleasure of figuring this lovely species.

A prominent feature of the ♂♂ of this species is the beautiful gradation of the silky golden or greenish yellow of the under wings to a very green ruddy yellow towards the base and interior margin. Viewed obliquely against the light, the golden becomes intense.

POMPEOPTERA POMPEUS.

Papilio Pompeus, Cramer, Pap. Ex. I., t. 25, f. A., ♂ (1775).
,, ,, Esper, Aus. Schmett., t. 24, f. 2, ♀. (1785-1798).
,, ,, Herbst, Pap., t. 2, f. 3 (1788?).
,, **Astenous,** Fabricius, Sys. Ent. iii., i., p. 19, 59 (1793).
Papilio Pompeus, Merian, Ins. Surinam, t. 72 (1719) (loc. error).
Troides Astenous, Hubn, Verz. bek. Schmett, p. 88 (1816).
,, **Heliacon,** Donovan's Ins. India, t, 18, f. 1 (1800). [Cerberus form ?]
Papilio Amphrisius, v. Godart, Enc. Méth. IX., p. 27, n. 7 (1819).
Amphrisius Nymphalides, Swainson, Zool. Ill. Ins. II., t. 98 (1833).
Ornithoptera Pompeus Heliacon, Boisdv. Spec. Gen. Lep., p. 18 (1836). Java and Sumatra.
[Boisduval regards *pompeus* as a synomyn of Heliacon. The two forms *pompeus* and *cerberus* are here united.]
Ornithoptera Pompeus, ♂ ♀, Doubleday and Hewitson's Gen. of Diurn., Lep. I., p. 4, n. 9 (1846). Java.
,, ,, ,, Gray, Cat. Lep. Ins. B. M. I., p. 5, n. 13 (1852).
,, ,, ,, ,, List Lep. Ins. B. M. I., p. 5, n. 15 (1856).
,, ,, ,, Horsfield and Moore, Cat. Lep. Ins. Mus. East India Company, I. p. 87, n. 177 (1857).
,, ,, Verh. z. b., Ges. Wien., p. 291, n. 28 (1864). [Gives "Java" as "New Guinea (eadem ?")]
,, ,, ♂ ♀, Moore, Proc. Zool. Soc., Lond., p. 756 (1865). Bengal. [This form is *Cerberus* of Felder.]
,, ,, ,, Wallace, Trans. Linnæan Soc., V. xxv., n. 9, p. 39 (1865).
Ornithoptera Pompeus, ♂ ♀, Vollenhoven, Tijdschr. v. Ent. III., p. 71, n. 7 (1866). Padang (Sumatra), Java, and N. Guinea. [The Java example may be *Pompeus*, but the others will probably be *Cerberus*; Vollenhoven calls them *Heliacon* of Felder.]
Ornithoptera Pompeus, Butler, ♂ ♀, Cat. Diurn. Lep. descr. Fabricius, p. 235, n. 4 (1869).
Papilio Pompeus, W. F. Kirby, Syn. Cat. Diurn. Lepid., p. 519 (1871).
Ornithoptera Pompeus, Distant, Rhop. Malayana, p. 326 (1871).
Ornithoptera Heliconoides, ♂ ♀, Moore, Proc. Zool. Soc., Lond., p. 592 (1877).
Ornithoptera Pompeus, Oberthür, Études d'Entomologie, (Cat. Raisonné de Pap. de la Coll. de Ch. Oberthür), p. 32 (1879).
Ornithoptera Heliconoides, ♂ ♀, Wood Mason, Journ. Asiatic Soc., Bengal, p. 252, n. 94 (1881). Andaman Islands. [This is *Cerberus*.]
Ornithoptera Heliconoides, Stäudgr. and Schatz, Exot. Schmett I., p. 5 (1884).
Ornithoptera Pompeus, ♂ ♀, De Nicéville, Journ. Asiatic Soc., Bengal, p. 373, n. 171 (1866). Cachar. [One ♂ taken August 6th at Irangmara, 1 ♀ on July 2nd and at Sildubi, 1 ♀ taken on July 28th, at Irangmara. These are *Cerberus*.]
Ornithoptera Pompeus, W. F. Kirby, Cat. Diurn. Lep. formed by the late W. C. Hewitson, p. 1 (1879).
Ornithoptera Pompeus, ♀ ♂, Watson, Journal of the Bombay Nat. Hist. Soc., p. 26 (1888). Burmah. [*Cerberus* form.]
,, ,, Dr. F. A. Walker, Oriental Entomology, Part II., p. 13 (1887).
,, ,, ♂ ♀, Elwes, Trans. Ent. Soc., Lond., p. 422, n. 394 (1888). [The *Cerberus* form.]
Ornithoptera Pompeus, Fickert, Ueber die Zeich. der Gatt. Ornithoptera, p. 727, f. 5, Taf. XXI. ♂; f. 6, Taf. XXI. ♀; Pupa and larva, figs. 4, 5, Taf. XIX. (1889).
,, ,, ♂ ♀, De Nicéville, Journal Bombay Nat. Hist. Soc., p. 387, n. 86 (1890). Chin-Lushai. [*Cerberus* form.]
,, ,, Watson, Journal Bombay Nat. Hist. Soc., p. 387, n. 86 (1890). Lamtok. [*Cerberus* form.]
,, ,, ♂ ♀, De Nicéville, Gazeteer of Sikkim, p. 170, n. 459 (1894). [*Cerberus* form; very common.]
O. Pompeus, W. F. Kirby, Nature, Vol. 51, p. 254, col. 2. Larva and Pupa, p. 255, col. 1 (1895).
Troides Helena Cerberus, W. Rothschild, Novitates Zoologicæ, V. II., p. 219 (1895).
,, ,, ,, Handbook to the Order Lepidoptera, V. II., p. 264. Larva, p. 264. Pupa, p. 265. (1896.)

♂. Anterior wings velvety black, slightly graduated to a warm brownish black towards the posterior margin; the nervures fairly distinct, but the nervules are almost concealed by the dense black in a perfectly fresh example, except when viewed obliquely; the adnervular rays are so much subdued into a warm dark brown as to be seen with difficulty; the fringe lunules creamy white, and fairly conspicuous. Under surface dark smoky brown, very black from the base, much lighter towards the posterior margin; the adnervular rays, all but those connected with the 2nd and 3rd median nervules, very faintly expressed (or almost entirely obsolete); the latter are bluish white and prominent; a short bluish white streak also on the sub-median nervure; the fringe rays whitish, with 4 hastate discal marks very faintly indicated by greyish atoms nearly parallel to the outer margin, and intersected by the 4 branches of the median vein. The 3rd median nervure starts just beyond the cell.

Posterior wings a rich silky golden-yellow, with a slight greenish tinge, especially towards the base; base of the wing and subcostal region velvety black, interrupted by the sub-apical yellow portion of the general yellow wing area; 5 sub-marginal black orbicular spots run parallel to the posterior margin, whereof the first, situated between the 1st and 2nd discocellular nervules is large, the next 3 below much smaller, and the 5th 2-3rds the size of the 1st; the posterior marginal black border moderately broad and dentate; the abdominal wing fold and part of the sub-median area velvety black; the fringe lunules creamy-white, and obscure. [The *androconia* within the fold are fawn-coloured; very densely arranged, first in a line along the sub-median wing-fold, and then in several sets of densely-arranged masses on the whole of the rest of the pouch interior; the first line of these hairs or scales is formed quite after the manner of a feather, with the base of the quill starting from near the base of the wings so that the feather rays are all curved downwards: at what may be called the hinge of the fold there is a narrow line or canal dividing the remainder of the androconia from the feather-like portion, so as to allow of an easy closing up of the fold: the remaining masses of these peculiar scales have much the appearance of the densely clothed soft short fur of a vertebrate animal, and are arranged much in the same manner; the middle portion of this mass is depressed, and as the feather-like

rays are deeply concave, and consequently their terminals are much raised, it will be manifest that the depression mentioned above allows space for the terminals to fit in conveniently, so that when the pouch is closed, as it nearly always is, the abdominal portion of the wing should lie as nearly flat as the rest of the wing; the two edges of the fold, *i.e.* where they meet when the fold is quite closed, are within nearly white, especially towards the base of the wing. The peculiar form of the fold when nearly open will be understood by reference to plate 57 figs. 5, 6.* On the under surface of this fold the abdominal fringe of cilia or hairs, which are black and long, all start from the outer part of what I call the hinge of the fold, down the whole line of the inner margin, so as to enclose nearly the whole of the subdorsal portion of the abdomen of the insect. In the ♀ ♀ of this genus the abdominal fringe hairs are much shorter and fewer in number.]

Undersurface: The golden silky yellow, and all the dark areas of the wing are exactly the same in position and outline as above, but on the sub-median yellow area is a small sub-anal orbicular brown spot, within a patch of sparsely-dusted black atoms; the anal angle is black, and the abdominal margin warm brown-black; the fringe lunules, piceus. Eyes, nitid brown-black, and very prominent, with no light margin; villose tuft of the head velvety black; antennæ black, and stouter than in some species.

Thorax velvety black: pronotal collar red, but almost concealed in some examples; underside of thorax black with the usual pectoral red patches, but varying in extent; legs black.

Abdomen golden yellow, with the dorsum dark warm brown, the middle segments with a longitudinal fawn-coloured stripe, and all the annulations expressed in yellow; the usual lateral sub-dorsal black dots; and valves light fawn-coloured with a dorsal triangulate brown mark.

Length of costa of primary wings 69 mms.; of posterior margin 54, and interior margin 36 mms.; of secondary wings, width 34 and length 43 mms. Length of antennæ or abdomen 27, and of the thorax with the head 18 mms. Articulations of the antennæ 38. They are sometimes as many as 42 and 44 in some examples from the same locality. [See plate 56, figs. 1 and 2]

Hab. Java.

♀. Anterior wings black smoky brown, with the outer 5th of the cell buff or creamy white, blended into the dark part of the cell by dark atoms; the adnervular discal rays are of the same light tint and coalesce so as to form a continuous light area only divided from the distal part of the cell by the nervures—thick rays extending nearly from the subcostal nervure to the 2nd median nervule, and their terminals to a short distance of the posterior margin; the rays are graduated towards the posterior margin by smoky brown atoms till their terminals become greatly subdued, so as to nearly melt into the general brown of the disc; on the 3rd median nervule is a short rudimentary white adnervular submarginal ray, dusted with fumose atoms, and two others above and below the submedian nervure. The veins are all sufficiently stout and prominent; the fringe lunules are creamy or buff-white. The 3rd subcostal branch commences a little beyond the cell; the pseudoneura are fairly distinct, the 3rd terminating with a prominent black interrupting spot on the discocellular nervure.

Posterior wings, golden yellow; the basal end of cell, the base of the wing, and costal and subcostal part of the wing the same brown as that of the anterior wing, interrupted by a small sub-apical yellow mark; the posterior marginal black border projects into the yellow area of the wing in a series of long adnervular cones, surmounted by large black subcordiform spots, which are often connected with the cones themselves, and are 6 in number—the 6th being indeterminate in shape, only separated from the border by a small patch of yellow, and dusted with white atoms; the interior margin is brown, dusted with white atoms outside the submedian fold, while the yellow outside the 3rd median branch is subdued with a delicate buff-white, which becomes greenish at the anal angle. The fringe lunules are buff-white. The wings are strongly dentate, especially at the terminals of the 2nd and 3rd median nervules; the veins intersecting the yellow area of the wings are stout and deep black. Undersurface of the anterior wings in all respects almost entirely similar to the upper surface, with a faint streak of white atoms on the submedian fold.

The posterior wings also differ very little on the under from the upper surface, except that the row of discal black spots are rather larger, and more irregular in shape, and are not united with the conical projections of the black border as above: they are all bordered with patches of white atoms: there is an orbicular black spot in the yellow at the anal angle: and all the yellow spaces between the nervules are intersected and subdued by stripes of pale white, a part of the yellow of the cell being treated in the same manner. The veins are all fairly prominent.

Head and thorax velvety black; eyes dark castaneous brown; antennæ black; pronotal collar red—the colour nearly concealed by the black; with large pectoral red patches within the dark brown; legs stout and black; abdomen fumose brown—each annulation divided by fine yellow lines, the sides and subdorsum golden and pale yellow with lateral black dots, and dorsal small black bars.

Length of costa 70 mms.; width of anterior wing 46 mms.; length of hind wing 54, and width 36 mms; length of abdomen or antennæ 26 mms.; of thorax with head 21 mms.

Length of legs:	1st pair:	femur	12;	tibia	7;	tarsi	11	mms.
	2nd ,,	,,	11;	,,	13;	,,	13	,,
	3rd ,,	,,	12;	,,	12;	,,	14	,,

Habitat, Java [Cramer's type was from Java].

For the ♂ described in this paper see Pl. 56, figs. 1, 2, 5.

For the ♀ see Pl. 57, figs. 1, 2.

♀. The posterior wing of a variety is figured on Pl. 57, drawn from both surfaces. It will be seen that while the amount of variation from the type fig. is fairly noticeable the general plan of the pattern is followed in this variety. Not so, however, in the case of the interesting

*In another part of this work I hope to give figs. showing the structure of these scales, and those of the sexual brands of the ♂ Ornithoptera in the 1st Vol.

variety which I have introduced in Pl. 56, figs. 3 and 4. Here the upper wing bears a considerable resemblance to Doherty's *nereis*, while the posterior wing is very distinctly different in the pattern arrangement. The wing is more strongly dentated than in the type form; a marginal band of black cones, larger than those of the type form extends from the apical to the anal angles; an oval black spot is between the 2nd and 3rd median branches above the cone; 2 faint atomic spots between the 1st discocellular and 1st median branches; the marginal cones are finished with black atoms. The basal half of the cell, the costa, and part of the area of yellow between the costal and subcostal nervures is occupied by black; the abdominal margin and part of the submedian area are dark brown, with a short narrow white streak at near the anal angle. The under surface of the wing is similar to that above, except that the marginal cones are rendered incomplete in shape by whitish atoms, the fringe lunules are rather broader, and a discal row of 5 black spots obtains, of which the 2nd and 3rd are atomic; there is also a V-shaped white mark on the black parallel to the costal and subcostal veins. The body of the insect is like that of the ♀ type; length of costa 76 mms. The specimen is believed to come from Java, and is in the museum of Mr. H. Grose-Smith, to whom I am indebted for the pleasure of figuring and describing it.

A ♂ in the collection of Mr. F. Moore is smaller than the usual examples (the length of the anterior margin 58 mm.) The anterior wing is smoky Velvety brown; the adnervular rays more than usually light—slightly greenish in tone; the exterior wing with a basal black cone within the cell, and the usual outer marginal bands of black cones, but the yellow is immaculate. This is evidently the type form for Java; for an example in my own collection from Java is larger. (Anterior margin of anterior wing 66 mms), the adnervular rays very obscure, the basal 5th of the cell is transversely black; an orbicular black discal spot between the 1st and 2nd median branches, a larger oval spot united to the apex of the anal angular cones, and between the costal vein and the subcostal branch on the *left wing only* is a small black dot; a small yellow apical spot is also on the black of the costa. A second example has the black dot replaced on both wings by an irregular black spot, and the spot between the 1st and 2nd median branches is only small and rudimentary. This pattern arrangement is like that which generally prevails in most of my examples of the *cerberus* form, and those I have seen in other collections—though many of the *cerberus* examples are without any other spot on the yellow of the midwing except the oval spot at near the anal angle, sometimes confluent with the curve of the margin, sometimes separate from it. The *cerberus* examples are generally larger than in their Japan relatives, and the black of the anterior wings is much deeper and colder in tone.

An example of the ♂ *pompeus* in the Hope Museum at Oxford has a large apical orbicular spot.

THE *CERBERUS* FORM.

Papilio Cerberus, Felder, "Verh. z. b. Ges. Wien." p. 291. n. 31 (1864) id. "Reise Novara, Lep. I., p. 19, n. 10 (1865), ♀ ♂. Darjiling, Sylhet.
Papilio Pompeus, Var. c. P. Cerberus, W. F. Kirby, "Syn. Cat. Diurn. Lepid., p 520 (1871).
Ornithoptera Heliconoides, Moore, "Proc. Zool. Soc.," p. 592 (1877), ♂ ♀.
,, ,, Wood-Mason and de Nicéville, "Journal Asiatic Soc. Bengal," p. 237, n. 65 (1880), ♂ ♀. Andamans.
,, **Hephæstus,** Distant, "Rhopalocera Malayana," p. 328., n. 2. t., 27, f. 2, (♀) ab. 3 (♂), 4 (♀), (1885) Malay Peninsula.
,, ,, Weymer, "Stett. E. Zeit.," p. 270 (1885), Nias.
,, **Cerberus,** Fickert, "Ueber die Zeichn. Gatt. Ornith.," p. 732 (1889), ♂ ♀.
,, **Hephæstus,** Hagen, "Iris" VII. p. 18, n. 3 (1894), p p. Sumatra.
,, **Cerberus,** "Staudinger und Schatz," Exot. Schmet. I. p. 4, t 2 (1884), ♂, N. India (Java, local error.
,, ,, Swinhoe, "Trans. Ent. Soc. Lond." p. 311 n. 372 (1893), Khasia Hills in Sylhet. ♂ ♀.
Papilio (Ornith.) Cerberus, Robbe, "Ann. Soc. Ent. Belgæ," p. 123, n. 1 (1892), Sikkim ♂ ♀.
Troides Helena (d) Cerberus, Rothschild, "Novitates Zoologicæ," vol. II., p. 219 (1895).

This form may generally be distinguished from the Javan *Pompeus* by its more elongate wings and darker colouring; also by its larger size.

It is found to inhabit continental India, from Sikkim to Assam; and also Burmah, Sumatra, Banguey, Penang, Borneo, Lombock (*Wallace*), and the Isle of Nias. Of course the Nias and Sumatran representatives are *varieties* of *Cerberus*, just as the Andaman Island form of *Heliconoides, Moore*, is a recognised and marked variety of *Cerberus* or *Pompeus* (whichever we may please to consider the type name to be). In India Cerberus has a wider range than *P. Rhadamanthus* and is in flight during a longer period of the year. It is found in hot valleys at from 2,000 to 3,000 feet, and flies with a slow sailing about the flowering trees from May to October, according to Elwes, who quotes the species as *Rhadamanthus*, though it is evidently *Cerberus*. According to Lieut. E. Z. Watson, (communicated by Mr. J. A. Murray to the Victoria Natural History Institute), Cerberus (Pompeus *Watson*) is common at Beeling in Upper Tenasserim, and Poungadaw in Upper Burmah; at the first locality he found it from January to April, in the second during October and November. Beeling is a village 60 miles north of Moulmein, surrounded chiefly by bamboo jungle, with a fair proportion of large trees. Poungadaw is a small village just across the old frontier, 30 miles North West of Thayetmyo, in the midst of a jungle of low bushes, very inferior to Beeling from a butterfly point of view.

Among the other localities where Cerberus has been taken, may be mentioned The Khasia Hills, where, according to Col. Swinhoe, it is common; also at Darjiling and Kurseong, according to Robbe, and Assam generally, Bengal (Felder), Malacca, the Natuna Islands, the Banquey Islands, and Padang, Sumatra, and New Guinea (?)

Lionel de Nicéville, "Gazeteer of Sikkim," p. 170, n. 459 (1894), says of Cerberus, " The N. Indian form has been described by Felder as *O. Cerberus*, but it cannot, I think, be separated from the typical form, which was described from Batavia in Java (by Cramer)." It is more common than Rhadamanthus, and occurs at the same time of the year. Mr. de Nicéville also speaks of the species as having been collected by Mr. F. E. Dempster during the expedition to Chin Lushai in 1889-90, and at Lamtok on June 4th, 1890.

The Andaman Island form of *Pompeus* or *Cerberus* was, in 1877, described by Mr. F. Moore (Proc. Zool. Soc., p. 592), as a distinct species under the name of *O. Heliconoides*. For the sake of comparison, this description is here reproduced. " ♂ Upper side of fore wings entirely black; hind wing golden yellow, with black abdominal fold, and, from base of submedian to middle of lower median veinlet, a marginal band formed by a series of 9 conical spots, decreasing in size from the anal angle; the 1st or anal elongated at its apex, the 2nd, 3rd, 5th and 6th each with a contiguous small upper round spot; the space at base of wing broadly across end of cell to middle of costal vein also black. Undersides as above; forewing very slightly grey, streaked along the base of the lower median veinlets.

" ♀ Forewing with prominent greyish white streaks along the veins, and similar streaks within the end of the cell: hind wings with black abdominal fold, a partly constricted elongated spot above the anal angle, outer marginal band of large continuous cones, a discal series of 5 small spots, the space at the base of the wings occupying the interspace between the costal and subcostal to near its end. Under-side as above. Abdomen greenish to black above, yellow at the sides and beneath. Red collar slightly perceptible in ♀. Expanse ♂ 5 6-8ths, ♀ 6 4-5th inches. S. Andamans (Port Blair)."

" In a series of 4 examples of the ♂ from the above locality one specimen had all the black spots of the hind wings absent except the first or anal, which is fused with the marginal conical spot, as is generally the case in the continental specimens. In another the 2nd spot is present on the upper side only; in a third the 2nd and 3rd, and in a fourth the 2nd, 3rd, and 6th." In the continental specimens, these variations occur on both sides in a large series of example, as may be seen by examining any of our collections, public or private—indeed it is not easy to bring together a number of examples with a uniformity of pattern from any locality.

" Of 5 ♀ ♀ also two have the upper wings conspicuously rayed with white, like some of the Assam specimens, and 3 (2 from Little Brother Island and 1 from S. Andamans) have the veins of these wings either simply bordered on both sides with paler black than the general ground colour, or only exhibit here and there faint traces of white scales like others from southern slopes of the Khasia Hills (*Sylhet*). The ♂ ♂ which are least differentiated from the ♀ ♀ in point of markings, also resemble them in the fuller and more broadly rounded inner angle of their anterior wings." [Wood Mason, " Journal of the Asiatic Soc., Bengal, p. 252 n. 94, 1881]. I have thought it best to quote almost the whole of this Author's remarks, though in a somewhat different order.

An examination of a ♂ of Mr. Moore's *heliconoides* in the British Museum Collection may be added :—

♂. 1st example in the series. Anterior wing quite black—the veins almost invisible. Posterior wing yellow with broad black marginal cones, the veins being black. Under surface the same, except that the anal-angle cone is larger and more pronounced than on the upper side, and separate from a discal black spot at its apex.

♀ Anterior wing dark brown, a little lighter toward the outer margin; the ochreous-white adnervular rays very broad, shaded or graduated very delicately from the discoidal cell by a dusting of brown scales; the cell at its distal end is treated the same. Posterior wings yellow, with a broad marginal band of black cones, or rather dentate marks, each one from the upper part of the wing reaching farther into the disc, and at the apex of each, though detached from them (except at near the apical angle) is a different-sized tear-shaped black spot; the costa, the basal part of the cell, and all the space above the 2nd and 1st veins, except two small yellow portions, black; undersurface with the posterior yellow area much paler than above, and suffused with white; the white fringe lunules prominent, and united with each marginal cone by a dusting of white atoms.

The type ♂ of Felder's *Cerberus* has on the underside of the posterior wing, between the 2nd and 3rd median veinlets a subconical black spot rather longer than the marginal cone beneath, from which it is only slightly separated by the discal yellow, and also a faint black spot above it; a small orbicular black spot also between the 1st and 2nd median veinlets; there is also a rather large submedian black mark above the anal angle. In other respects this example generally corresponds with the prevailing specimens of Cerberus. Expanse of the anterior margin of the upper wing 71 mms. Hab. Sylhet. Felder's type ♀ was from Cachar, collected by Dr. Stoliczka. The anterior marginal length of the type ♀ of Moore's *Heliconoides* is 90 mms.

The types of the Javan *Pompeus* of Cramer are in the British Museum (?); of Felder's *Cerberus* in the Tring Rothschild Museum; and of Moore's *Heliconoides* in the rich Indian collection of Mr. Frederick Moore.

By the foregoing it will be seen that I propose to recognise *Pompeus* as the type form of this species, by reason of its priority of description by Cramer 90 years before Felder described its continental relative; *Cerberus* and *Heliconoides* will thus be varieties of *Pompeus*—the latter being considered again a local var. of *Cerberus*.

A careful comparison of sets of the 3 forms will prove that they all belong to one widely distributed species.

POMPEOPTERA RHADAMANTUS.

Papilio Astenous, Eschscholtz, "Kotzebue's Reise," III., p. 205, t. 4, f. 6a, 6b, 6c, (♂ ♀), (1821).
Ornithoptera Rhadamantus, Lucas, "Lepid. Exot." p. 5, (♂ ♀), (1835).
,, **Amphrysus,** Lucas, "Lepid. Exotica," t. 2, f. 1 (♂); (1835).
,, **Rhadamanthus,** Boisduval, "Spec. Gén. Lép." I., p. 180, n. 8, (1836), ♂, and *var.* ♀.
,, ,, Reakirt, "Proc. Ent. Soc. Phil." p. 444, n. 1, (1846), ♂ ♀.
,, ,, Oberthür, "Ét. d'Ent." IV., p. 32, n. 16, (1879), ♂ ♀.
,, ,, Dewitz, "Nov. act. Kais Lep. Ac. Nat." XIV., L. n. 2, p. 262, t. 2, f. 7, 7a, 7b, (1882), ♂ ♀.
,, ,, Staudinger and Schatz, "Exot. Schmett." I., p. 4, t. 1, (1884), ♂ ♀.
,, ,, Fickert, "Zoologischen Jahrbuchen," p. 733, (1893).
,, ,, Leach, "Butterflies of China," &c., p. 513, (1893), ♂ ♀.
Papilio Nephereus, Gray, "List Lep. Ins." Brit. Mus. I., p. 6, n. 17, (1856).
Ornithoptera Nephereus, "Wallace. Tr. Linn. Soc." Vol. XXV., (1866).
,, ,, Staudinger, "Iris," p. 4, (1889).
,, ,, Semper, "Philipp. Tagfalt." p. 264, n. 386 (1891), ♂ ♀.
Troides Rhadamantus, Rothschild, "Nov. Zoologicæ," Vol. II., p. 224, n. 21, (1895).
,, ,, Rippon, in Wytsman's "Genera Insectorum," Article "Papilionidæ," p. 13, (1902).

♂. Anterior wings, velvety black; the adnervular rays much subdued, especially the upper ones, by black scales on the grey, giving them the appearance of being rather greasy; the pseudoneura just visible. The costa of these wings is less arched than in some species, and the apical angle is rather pointed. Posterior wings golden yellow, the narrow black outer margin divided into 4 black cones or lunations, the lowest surmounted by clouded patches of black scales on the yellow, extending in dentate form more or less towards the cell; the abdominal margin and fold black; the base and costa also black, the veins strongly black.

Under surface of anterior wings as above. The cell and distal ends of the pseudoneura a little more prominent, and partly bordered by white. The submedian and interior margin are black. The undersurface of the posterior wings as above; the scaled spots from above show faintly through when examined by transmitted light.

Head, Antennæ and Thorax velvety black; pronotal collar red; eyes fucous brown; abdomen above brown, the articuli expressed slightly in yellow; the sides and subdorsum yellow, with rather large lateral black dots; anal valves light buff. Thorax on the underside velvety black, with the usual pectoral red patches; legs brown.

Length of costa 66, of outer margin 51 and inner margin 35 mms. Greatest length of posterior wings 40 and width 25 mms. Length of abdomen or antennæ 30, and of thorax with head 20 mms.

Length of Legs { 1st pair: Femur, 12; tibia 9; tarsi, 10 mms.
2nd ,, ,, 12; ,, 11; ,, 12 ,,
3rd ,, ,, 11; ,, 12; ,, 15 ,,

Habitat. Most of the Philippine Islands all the year round. Common. *Not* found in Cochin China, nor in China.

The species Æacus or *Rhadamanthus* of Boisduval is an inhabitant of Indo-China.

A number of examples in the author's museum are quite uniform in pattern.

♀. Anterior wings dark brown, with prominent adnervular white rays, subdued by brown scales; the pseudoeura very prominent; the distal 1-3rd of the cell scaled white or grey, with two long black cones terminating close to the distal end of the cell in the grey. Undersurface as above, but the rays are purer white, and more prominent, and the sub-median vein runs part of its course through a narrow white streak or ray.

Posterior wings: the greater part of the cell yellow; the submedian area yellow, and nearly 1-3rd of the discal area yellow; the remainder of the wing deep black, with an almost obsolete transverse band of minute yellow spots; the marginal light lunations are creamy buff; a brown submedian area indents itself strongly into the yellow. Undersurface as above, except that the yellow of the wings is richer and purer; and the transverse band of cuneiform yellow marks is not obsolete; in some examples a narrow pale yellow stripe extends up 1-3rd of the inner margin from the anal angle, and the submedian indentation is only indicated by faint scaling.

Head, antennæ and thorax above black, eyes nitid red-brown; abdomen above brown, beneath yellow, with small lateral black dots. Thorax beneath black with the usual pectoral red patches; legs black.

Length of costa 33, of outer margin 57, and inner margin 44mms. Greatest length of posterior wing 54 and width 36 mms.

Length of abdomen or antennæ 30, of thorax with head 18 mms.

Length of Legs. { 1st pair: Femur, 10; tibia, 8; tarsi, 11 mms.
2nd ,, ,, 11; ,, 11; ,, 15 ,,
3rd ,, ,, 11; ,, 11; ,, 15 ,,

Habitat. Philippine Islands.

In the author's museum.

An example of the ♀ in the author's collection is very richly black on both wings—the white very strong, and beautifully scaled; the hind wing above has no discal yellow spots. The undersurface of the anterior wing very rich grey white; the posterior wings with the transverse band of submarginal spots larger, the lower ones yellow, the upper white; and the submedian black extends upwards a good way into the yellow. The abdomen above smoky black; the sides and subdorsum rich yellow and orange, the subdorsal articulations emphasized in black spots.

Habitat. Manilla.

My figure is drawn from this example.

Specimens of the ♂ range from 45 mms. for the length of the costa to 80 mms., or more.

There is a great *prima facie* similarity between the ♂ ♂ of Rhadamantus (or *Nephereus*), and Æacus (or *Rhadamanthus*), which has often led to confusion in the minds of authors. By observing the following rules the ♂ ♂ of the two species may be readily separated:—

a Anterior wings rounded at the apical angle, *Æacus*. *aa* Slightly acute at the apical angle, *Rhadamantus*.

b The adnervular rays white on the upper surface, *Æacus*. *bb* Not so white, but subdued by delicate scaling so as to appear greasy, *Rhadamantus*.

c Posterior wings with 3 scaled submarginal short patches above the lower marginal black lunations, *Æacus*. *cc* With 4 accuminate scaled patches nearly reaching to the cell, *Rhadamantus*.

d Posterior wings rounded, and normal relatively in size to the anterior wings, *Æacus*. *dd* Posterior wings not rounded but pointed or acute at the anal angle, and smaller and narrower relatively to the anterior wings, *Rhadamantus*.

e The abdomen does not extend below the posterior wings, *Æacus*. *ee* The abdomen extends below the posterior wings, *Rhadamantus*.

f The pattern on the abdomen differs in the two species.

g The ♀ pattern resembles that of *Minos*. *gg* The ♀ ♀ totally different, the pattern more like those of the *Helenus group*.

h Habitat: Cochin China, China, Perak, Siam, &c., *Æacus*. *hh* Habitat: Sandwich Islands exclusively, *Rhadamantus*.

In an example of the ♀ of *Rhadamantus* in the collection of my friend the Rev. Mr. Fuller, the middle adnervular rays of the anterior wings are only faintly represented.

POMPEOPTERA HELENA, *VAR. LEDA*.

Ornithoptera Helena, *Var. Leda*, Staudinger, "Iris," IV., p. 74. (1891.)

♂. Anterior wings brown black, immaculate, as in *Criton* undersurface dark warm brown, darkest at the base, graduating much lighter towards the posterior margin; the adnervular light rays just traceable till they reach to near the posterior margin where they are quite defined, well formed by grey scales. The whole pattern can be traced out by careful examination in a good light.

Posterior wings velvety black, with a fairly broad discal area of rich golden yellow, and 1-2rd of the cell, distal end, of the same colour. The veins are all very stoutly emphasized with black, being thicker towards the outer margin; the arrangement makes the submarginal area of black very broad, as it also does with the submedian. The submarginal border divisions are not dentate or definitely lunate towards the disc, but between the 1st and 2nd discocellular veins the yellow indents the black border, somewhat as among the ♂ ♂ of *Helenus*. Undersurface of the wings as above; except that the yellow occupies slightly more of the disc, and its outlines are nearly all scaled with black; there is also a thin line of yellow atoms running parallel on the outer side with the 3rd median nervule.

Head and thorax black; eyes nitid brown; pronotal collar red; abdomen light brown above, subdued yellow beneath; anal valves buff brown.

Length of costa 71 mms. Length of abdomen or antennæ 26, and of thorax with the head 17 mms.

Length of Legs.	1st pair:	femur,	10;	tibia,	7;	tarsi,	9 mms.
	2nd ,,	,,	12;	,,	12;	,,	14 ,,
	3rd ,,	,,	12;	,,	11;	,,	14 ,,

Habitat, Salayer (or Salajer), Island.

POMPEOPTERA CRITONOIDES.

Ornithoptera Criton Critonoides, Frühstorfer, "Societas Entomologica," of Zurich, XVIII., p. 50, (1903).

♂. Anterior wings a rich velvety black, with steel-blue reflections; quite immaculate, and the veins hardly distinquishable. Undersurface shining black; the adnervular rays only reach to the upper side of the 3rd median nervule, and are light blue; at the distal end of the cell the light blue marks are divided by the pseudoneura into 3 parts, the upper section being the largest and broadest, or 1-3rd the cell length.

Posterior wing: one half the cell rich silky yellow, with greenish reflections, curved inwardly towards the base; two-thirds of the discal area of the same yellow, its outline following the outline of the outer margin, and leaving a broad submarginal 1-3rd black; all the rest of the wing is also black. Undersurface as above.

Head and thorax black; pronotum with red collar; abdomen silky black above, yellow beneath.

Length of costa 67 mms.; of outer margin 51, and of inner margin 35 mms. The inner margin is nearly straight. Length of posterior wing 41, and width 29 mms. Length of abdomen or antennæ 29 mms.; of thorax with head 20 mms.

Length of Legs.	1st pair:	Femur,	10;	tibia,	8;	tarsi,	11	mms.
	2nd ,,	,,	10;	,,	14;	,,	14	,,
	3rd ,,	,,	10;	,,	14;	,,	15	,,

Habitat, Oby Island.

In the collections of the Hon. Walter Rothschild, Mr. H. Grose-Smith, Col. Rimington, and others.

♀. Anterior wings silky dark brown; the adnervular rays just distinguishable in a slightly silky brown. Undersurface as above, except in being of a lighter brown, rufus-tinted; the adnervular rays faintly indicated by gray atoms: the lighter marks at the distal end of the cell also treated in the same way.

Posterior wings very black and silky; a yellow mark incurved towards the base, from the distal end of the cell, one-fourth from the base; the silky golden yellow of the disc only occupies 2-5ths—thereby constituting a very broad submarginal black band, with 3 almost obsolete small yellow discal spots on the upper part of the wing—indicating the commencement of a possible submarginal transverse band of yellow cuneiform spots. The creamy-white outer-marginal fringe lunations are very thin. Undersurface as above, except that the yellow areas are outlined whitish, and the transverse band of cuneiform spots, though small, extend round the wing, and a small group of white atoms is present outside the 3rd median nervule.

Head and thorax black; eyes, nitid brown; pronotum with obscure red collar; abdomen above silky warm brown; beneath yellow scaled, with large lateral black dots, and subdorsal black marks on the articuli.

Length of costa, 66 mms.; length of outer margin, 47 mms., and of inner margin, 37 mms. Greatest length of posterior wing, 42 mms.; greatest width, 29 mms.

Length of abdomen or antennæ, 26 mms.; of thorax with head, 17 mms.

The inner margin of the anterior wing is nearly straight.

Length of Legs:	1st pair:	Femur,	;	tibia,	;	tarsi,	mms.
	2nd ,,	,,	;	,,	;	,,	,,
	3rd ,,	,,	:	,,	;	,,	,,

Habitat: Island of Oby.

In the museum of the Hon. W. Rothschild, Mr. H. Grose-Smith, Col. Rimington, &c.

♀. A remarkable abnormal variety. Anterior wings: nearly one half the cell (outer portion) creamy white; the white continued into the disc so as to occupy a considerable portion of its area—the adnervular rays (which extend nearly to the outer margin of the wing) being confluent with it; the submarginal brown-black divided into a series of long indentations—gradually increasing in length towards the costa; slightly more than half the cell from the base black as is also the rest of the wing; all the dark outlines are extensively scaled with white atoms; the marginal light lunations form a continuous buff white line up the posterior margin; the veins all very prominent. The undersurface of the wings almost exactly as above in colour and pattern.

Posterior wings, with a central discal area of buff-white, slightly yellow tinted, occupying one half the length of the disc, and extending from above the 1st discocellular to the 3rd median nervule; the remainder of the disc is brown-black, interrupted nearly midway by a transverse band of adnervular cuneiform creamy-white marks, extending from the anal to the apical angles; about 1-4th of the cell from the distal end creamy-white; all the remaining area of the wings brown-black, with a slight line of white atoms along the submedian fold. The posterior marginal lunations with a continuous outline of buff-white. Undersurface as above, except that the light area is following by a transverse row of suborbicular black spots, scaled all round—followed by a transverse light band of cuneiform marks, and finished by the submarginal lunate black band, rather extensively scaled with white atoms; part of the submedian area is also white, with a black orbicle.

Head and thorax brown-black; abdomen dark brown, sordid yellow at the sides, subdorsum yellow—the articuli well marked in black.

Length of costa, 77 mms.; of posterior margin, 58 mms.; and of interior margin, 40 mms. Length of posterior wing 50, and of width 40 mms. Length of abdomen or antennæ, 30 mms.; of thorax with head, 20 mms.

Length of Legs: 1st pair: Femur, 10; tibia, 7; tarsi, 10 mms.
2nd ,, ,, 11; ,, 12; ,, 13 ,,
3rd ,, ,, 10; ,, 12; ,, 13 ,,
inclusive of the trochanters.

The 3rd subcostal nervule is emitted at 2 mms. from the distal end of the cell; the 4th and 5th at 8 mms.

Habitat: Oby.

In the Museum of the Hon. Walter Rothschild.

This is a very distinct variety. Its anterior wing resembles somewhat the anterior wing ♀ of *Iris* from Timor Laut, and the corresponding wing of *Nereis*. It may yet be found to be the ♀ of an undescribed species.

POMPEOPTERA HYCETUS, SPEC. NOV.

Pompeoptera Pompeus ♀, Rippon. The present work, Vol. II, p. 54, pl. 56, figs. 3, 4 (1895).

In the portions of this work mentioned above, I described and figured an interesting variety (as I at that time considered) of the ♀ of *Pompeus* (type form) from Java. Unfortunately I forgot, in writing the text, and the names on the plate, to state that this ♀ was not a type ♀, but a variety of the type, though I take note of it a little later on.

The circumstances of the case were these: In the cabinet of Mr. Grose-Smith, at that time placed under the ♂ of the type *Pompeus*, was the insect referred to, which I took to be a remarkable variety, as it did not fit with any other Javan species, nor indeed with any species from extra-Javan countries. It was labelled Java, and I had the pleasure of borrowing, figuring and describing it. After I had returned it I found later on that Mr. Grose-Smith had placed it in a new position, and he asked me more than once what I really thought it was. Recently, in comparing my fig. with those of others allied to it, I have arrived at the conviction that it is an independent species, and not a variety; and I herewith repeat my former description of this beautiful form, for which I now propose the name P. Hycetus. What the ♂ of this new species is like, time only can show; and were it not that this ♀ is so distinctly unlike anything else which I have seen, I should have hesitated to describe the new species from the ♀ only.

♀ Anterior wings dark fumous brown; with the outer 4th of the cell buff or creamy white, blended into the dark part of the cell by dark atoms, or scales; the adnervular discal rays are of the same light tint, and coalesce so as to form a continuous light discal area, divided only by the nervures and nervules; these rays extend nearly from the subcostal nervure to the 2nd median nervule, and their terminals to within a short distance of the posterior margin, and are nearly uniform in width; the rays are graduated towards the outer margin by smoky-brown scales; on the 3rd median nervule is a short rudimentary white adnervular ray, dusted with fumose scales, and two others above the submedian nervure. The veins are all sufficiently stout and prominent; the fringe lunules are creamy buff-white. The 3rd subcostal nervule commences a little beyond the cell; the pseudoneura are fairly distinct, the 3rd terminating with a distinct gray spot close to the discocellular nervure, but within the cell.

[In the Genus Pompeoptera the pseudoneura are generally very distinct, especially in the females, often appearing like thin nervures or veins—an indication that probably some remote ancestors of the Papilionidæ possessed a more superficially complex structure. In the cell of the posterior wings of some of the Papilionidæ these pseudoneura may be found, sometimes prominently visible, but often only just traceable by a careful examination, in a favourable light.]

Posterior wings, golden yellow, having somewhat the appearance of an example of *Pompeus*, or of *Cerberus*, its Indian analogue; the basal end of the cell, the base of the wing, and costal and subcostal parts of the wing black (or brown-black) uniting at the apical angle with the black outer marginal border—though partly interrupted by a small subapical intersection of the discal yellow; the posterior marginal black projects into the yellow area of the wing as a series of moderately long lunate cones, larger than those of the type form of *Pompeus*, extending as usual from the apical to the anal angles; an oval black spot is between the 2nd and 3rd median branches above the lower lunation; two faint atomic spots between the 1st discocellular and 1st median branches, the lunular cones are finished with black atoms; a short narrow white streak is near the anal angle; and a triangulate white mark on the black at the apical angle.

The undersurface of the anterior wing almost exactly as above, except that the white is purer, and the brown more strongly scaled with white atoms, and the cuneiform mark at the distal end of the cell is not obsolute, as above. The undersurface of the posterior wing also as above, only that the yellow area of the cell and disc is lighter except near to the submarginal black border, where it is as rich as above; the marginal lunate cones are rendered incomplete in shape by a clouding of whitish and grey atoms, the light fringe lunules are rather broader than above, and a discal transverse row of 5 black spots obtains, the 2nd and 3rd being atomic; also, there is a long V-shaped white mark on the black, parallel to the costal and sub-costal veins. The body of the insect is like that of the ♀ of Pompeus.

Length of costa 76 mms.

Habitat: Java.

The type is in the Museum of Mr. H. Grose-Smith, and the specimen is at present unique.

Miscellaneous Notes on the Species and Genera of Troides not included in the previous descriptions, and nearly all in the Rothschild Museum at Tring.

SCH. PARADISEA.

Frühstorfer, in the "Organ of the International Entomological Society, Zurich-Hottinger," No. 7, p. 51 (1903) describes an aberration *auriflua*, from Kaiser Wilhelmsland.

Examples of the ♀ from Constantinhafen with all the black spots smaller than in the specimen figured in plate IV, Vol. I of this work, and with the abdominal marginal fringe of the ♂ the purest white; in two others from Binga, N. Guinea, the fringe is ochraceous white.

♀. All light maculæ, very ochraceous golden white; the posterior wings especially with rich submarginal ochraceous area, dotted with black and very small orbicles; the marginal band very narrow. From Finisterre Mountains, N. Guinea

♀. Hind wings smaller in proportion than the fore wings; the maculæ rather larger; the light ones very white. The hind wings, with the area below the spots ochraceous brown. From the same locality.

SCH. MERIDIONALIS.

An example of the ♂ from the Upper Aroa River: the obdominal marginal fringe very long and delicate, flowing down round the abdomen and above, so as almost to conceal it.

In some cases the body of Paradisea, on the upper surface is intensely white, with longitudinal central black lines, the yellow narrowed at the base and widening till the last three segments are entirely yellow; some ♀ ♀ are quite small.

Sch. Meridionalis is captured at the end of June.

SCH. TITHONUS FROM WAIGEU.

Anterior wing of ♂ small. The white area of the ♀ anterior wing and cell form two bands practically nearly enclosing an irregular dark space; on the lower half of the wings the white marks are large. ame collection.

♀. The cell marks very large. Example from Waigeu larger than from N. Guinea; all the white maculæ very large.

SCH. TITAN.

A ♂ from Geelvink Bay with three green orbicular discal spots on the posterior wing, the lowest and largest with a black spot on the inner point of it.

A ♀ from Aroa River with the anterior wings entirely dark rufous-brown; an outer row of very small, almost obsolete, white spots, three in number: an inner cuneiform spot between the 2nd and 3rd median branches; with faint traces of subcostal white streaks. Under surface, with the outer row of 6 spots, and an inner spot or mark rather larger than usual. The posterior wing yellow area above orange-yellow and white and scaled: more strongly orange at the anal angle.

O. PRIAMUS.

♂. Small; somewhat like *Euphorion* (or *Richmondia*) and bluish-green.

O. POSEIDON, *v. PRONOMUS.*

♀ ♀. Very dark, and with few markings; from Cooktown.

O. POSEIDON.

♂. From Kiriwini: posterior wing base above the cell with a black patch, followed by green and black from the costa—all scaled from the base.

♀. Very large. Anterior wing with one small spot between the 2nd and 3rd median branches; very pale brown wing. The posterior wing is darker. ♀. Similar, but with a submarginal row of five light spots; from the Trobriand Islands. ♀ from Fergusson Island: anterior wing with few spots, very small or absent. ♂ very blue, like *Eumæus*, and small, with large white marks.

♂. From Milne Bay and Mailu, very golden green, and bluish posterior wings.

♀. Var. *brunnea* from Milne Bay; no spots on the anterior wings. ♀ with normal large spots, from Redsca Bay, N. Guinea.

♂. Bluish green; Brown River, N. Guinea.

♂. With the inner discal spots showing through from the under surface; from Milne Bay.

♀. From Kapaur, with posterior wings and abdomen creamy orange or sulphur colour; anterior wings with spots a moderate size, white, and much scaled.

O. URVILLIANA.

♀ ♀. From Alu, Shortland Islands. Very large, and darker than those from Rendova. ♂ with cell of posterior wing filled in by black; and shining hairs from the base flow over this black.

♀. From Rendova; fumous brown and pale brown on both surfaces.

♀ ♀ of Urvilliana collected by Captain Webster at Kei Toeal, with buff or white marks; sometimes all buff marks; the cell almost entirely buff. Most of these examples are very large. One ♂ has the posterior wing with the cell green toward the base mingled with black; black near the costa, with green streaks, and an orange spot. A ♀ from Salawatti with small cell spots—the cell itself a rich creamy orange-yellow on both surfaces.

O. CRŒSUS.

♂. From Batjan; with much green on the posterior wing mingled irregularly with the orange; but in O. Lydius ♀ ♀ there is very little variation.

ÆTH. VICTORIÆ.

♂. From Guadalcanar with body creamy-white yellow towards the anal end; the basal mark black, a faint smoky orange longitudinal stripe down three of the segments, with two black lateral divided stripes, and subdorsal central black stripe; the abdominal fringe ochraceous white, the undersurface creamy white.

♂. Anterior wing, with upper part of the cell rich azure blue, melting into the green. Abdomen or body creamy orange white, and nearly obsolete black spots; from Guadalcanar. ♀ of Victoriæ from Florida Isle, with the cell marks nearly entirely white. Small examples of the same sex brown black; some still smaller, light brown.

Var. Regis ♂. Anterior wings with a large green yellow apical patch; posterior wing very blue green; the cell with much black. From Maleita. A ♂ from Bougainville light brown, with the cell spot very large. ♂ ♂ from Ysabel Island, with an apical yellow patch, a more or less sized black spot between the 5th subcostal and 1st discocellular nervules, and some examples without these spots. The ♀ ♀ vary in their anterior cell macula: in some the spot is entire and large; in others it is divided more or less towards the basal end.

P. HELENA, *v. PAPUANUS.*

♀. Very large. Anterior wing with distal half of the cell and a large proportion of the disc white; posterior wing yellow; undersurface all buff colour; from Stephansort. ♀. Anterior wing buff-white, posterior wing buff-orange.

♀. The anterior wings with a very large area of creamy white. From New Guinea.

P. HELENA, *v. CELEBENSIS.*

♀. All light marks buff-tinted on both surfaces. From Salayer. A buff-tinted ♀ differs from the preceding in having an extra spot above the 3rd median vein, and a larger submarginal light mark. From Banda.

P. HELENA. Type Form.

A ♀ from Bouru with anterior wing nearly occupied with white.

T. BROOKEANA.

♀. From Borneo; with 4 white subapical marks between the 3rd and 5th costal nervules and the discoidal and 1st median nervule; the green marks slightly white outwardly.

♀. From Sarawak; the white portions less vivid. The undersurface of anterior wing with submarginal white marks leaf-like; the discal golden green marks are tinted to an intense ultramarine blue at the base.

♂. With pronotal red collar very wide.

♀. Sarawak; more golden green. ♂. From Labuan also; very golden green, with the small maculæ very close together. A ♂ from the same locality, with the discal band parallel to the median vein, golden green; on the underside of the anterior wing, very regular in width, and the base of the lowest mark blue; a richer blue in an example from Sumatra. The uariety *albescens*, with the green marks longer and narrower, and extending nearly to the median nervure. The body is a lighter brown than usual.

♂. The underside of the anterior wing of 3 examples with very bright golden green marks, with small white submarginal spots separated and rather purple; posterior wings, with submarginal double lunate discal blue-grey lenticula marks; from Perak and Malacca.

P. HALIPHRON, *V. PISTOR.*

♂. Anterior wings with the light adnervular rays, except the submedian, narrow and obscure. Posterior wings with the yellow area green-tinted, rather more extensive than in *Naias*, but similar in outline; the yellow at the distal end of the cell a little less extensive than in *Naias;* abdomen dark fuscous brown; the undersurface of the anterior wings with the light rays purer. From Kalao.

P. NAIAS, *VAR. SOCRATES.*

♂. Anterior wings rich violet black. Undersurface of the cell white over the distal half, but obscurely close to the veins. Underside of posterior wings with the yellow area tinted emerald. From Sumbawa. Examples from Tambora, Sumbawa do not practically differ from the foregoing.

P. PLATENI.

♂. From Palāwan. A subcostal yellow mark divided by ragged edges of black, and a small submarginal yellow spot below the 2nd vein of the posterior wing. ♂. With long yellow stripe near the second vein, and a slight yellow spot in the cell of posterior wing.

P. ANDROMACHE.

♀. Anterior wing uniformly grey-white; amount of yellow very much restricted in one or two examples. Undersurface with deeper clouding than above.

♀. Anterior wings with large light area; the outer margin narrowly light fuscous brown, but increasing to double the width towards the apical angle, and very sinuate; the discal area clouded wave-like by very light brown scales—most extensive at the basal end of the sub-median sinus, lighter on the inner margin.

♀. Example very small, and more darkly clouded. From Kina Balu.

P. ÆACUS OR RHADAMANTHUS.

Common in low valleys in Western and Central China from May to October.

Beccari, "*Annali del Museo di Storia Naturale di genova*," *vol. 15, 1879-80*, remarks: "The Ornithoptera are very difficult to capture." Some species were taken in the Isle of Yule (N. Guinea), by M. Albertis, also at Mount Epa in 1875. Of these (Poseidon) ♀ ♀ with anterior wings clear brown, and slightly grey at the extremity of the wings above. Also in N. West N. Guinea the ♀ ♀ were uniform brown on the wings (probably the form *brunneus*); at Somerset, Cape York, examples with wings uniformly brown black; at Andai, N. Guinea, in 1872 he took a variety—"colour du fond est d'un brun foncé uniforme avec les parties blanchâtres trés oblìtérées par l'envahisement de la teinte brune, a l'aile supérieure."

P. CUNEIFERA.

♂ With no black maculæ on the posterior wing, or only one or two black spots, very large. From W. Java.

POMPEOPTERA PLATENI.

Ornithoptera Plateni, *Staudinger*, Correspondenz-Blatt des Entomologischen Vereins "Iris" zu Dresden. No. 5, p. 274 (1888).

O. Plateni, Dr. C. Fickert, Ueber die Zeichnungsverhältnisse der Gattung Ornithoptera, page 762 (1889).

THIS is probably one of the most remarkable and interesting forms of the sub-genus Pompeoptera which has yet been discovered and described. Although it seems to claim a close affinity with several species, notably *P. Rhadamanthus*, *Haliphron*, *Criton*, and still more *Nephereus*, —and in the colour reflections of the upper surfaces of the ♂, with the ♂ *Hippolytus*, it is still so distinct from them all as justly to merit a specific separation, that is to say, if we continue to regard the numerous forms of Pompeoptera as so many independent species. It would appear to be one of those instructive links between the local forms of a widely ranging species which makes it so easy to imagine that they all originated from the same parents. Dr. Staudinger tells us that—

"Four almost perfect specimens of this highly interesting species were sent to him by their discoverer, Dr. Platen, in whose honour he named them," and he goes on to describe the ♂ as distinguished from all known species by the "black uppersides of the secondary wings, which only on their upper portions have 2 yellow patches."

[It will be seen, by referring to my plate, that these are not really very extensive. At their narrowest they are only 4 mm., at their broadest 7 mm., and at their longest 20 mm. on the upper surface; so that the yellow occupies less than 1-7th of the whole surface of the wing, all the remainder being black, the dorsal portion of the abdomen partaking of a broad continuation of the same colour.]

"The ♂" he continues, "stands very near to *Nephereus* of GRAY, but it has a still broader black margin on the hind wings, and is very readily distinguished by the totally black outer and inner borders, which exhibit no yellow colour below the median nervure and the first median nervule."

[Its greatest extent is 22 by 18 mm., or roughly only 1-4th of the area of the whole wing. A ♂ *Nephereus* in my own collection has, allowing for the larger size of the hind wings, above 25 per cent. more yellow inclosed within its borders, and this colour extends right to the abdominal fold, which is not the case in *Plateni*—the space between the submedian nervure and the 1st median nervule being occupied by a silky dark brown, edged with pale ochraceous-brown grey.]

"—*O. Plateni* stands nearest to *Nephereus*, GRAY, which is the Philippine form of *Rhadamanthus*, BOISD, found in the southern portion of Asia," (in China) "and which may eventually be regarded as a remarkable local variety. The ♂ in question measures 101 mm. from the extreme points of the wings, (in one ♂ the fore wing is 68 mm.) and is a little larger than my largest example of *Nephereus*."

[The length of the same wing in the plate is 64 mm., or 5 more than the largest and 17 more than the smallest ♂ *Nephereus* in my collection, or in that of Dr. F. Walker.]

"—Yet the form of the wing changes often in this species, and it becomes almost worthless for the distinction of allied varieties. The upper surface is really quite black, like velvet, and the light grey longitudinal streaks between the veins appear more or less faintly through, according to the light; only at the median branch stand outwards a few grey scales on the black. On the under surface these peculiar transparent light-grey stripes appear distinctly as the bordering of the veins, although they are not quite so broad as in *Nephereus*, and the very small fringe is less perceptibly white."

[In some specimens of the latter they extend almost or quite to the posterior margin, and fill up 1-4th of the space between the 2nd and 3rd median nervules from the cell.]

"The hind wings are black: only on the front margin, between the costal and subcostal, and between the 1st and 2nd costal veins they are up to a pretty broad outer margin silky yellow. The lower yellow stripe-spot is in its outermost portion sprinkled with a few blackish *(Schwarzlichen)* scales, whilst under the 2nd subcostal nervure, and at the 2nd upper median nervule are a few yellow scales on the black scarcely standing out (or prominent—'*Kaum hervortretend.*') In the type, in the abdominal fold of this species, when opened, will be found a sordid brown hair, similar to that in *Nephereus*. The under surface of the hind wing is yellow, with black veins and brown black outer and inner borders. The outer black border is not only twice as broad as in *Rhadamanthus* and *Nephereus*, but its two middle portions are inclined inwards (sinuate), and deep down towards the inner have a graduated sprinkling of yellow scales *(allmählig gelb bestreut)*. The inner border is completely black below the 1st median nervule and the median nervure, with the exception of a narrow yellow stripe at the base.

♀. "The Primaries of the ♀ are so similar to those of *O. Nephereus* that they need no description. The white grey basal parts of the veins and stripes at the end of the discoidal cell are hardly less than in *Nephereus;* on the contrary the black outer border is decidedly broader, and the yellow colour below the median nervure and the 1st median nervule is entirely wanting. In the black outer border of the hind wings in 2 ♀ ♀ are a couple of small yellow patches above, whilst in a third ♀ only a small rudimentary patch is present. That the 6 yellow patches in the centre, divided by the black veins, are smaller than in *Nephereus* is seen by the presence on the black border of 2 white-greyish patches on the upper portion of the outer margin. The inner yellow spots are more or less of a peculiar white or sordid grey, which is never the case in any of my specimens of *Nephereus*; also below the median nervure remain more or less whitish-grey scales which in one ♀ form a clear broad whitish-grey stripe, sprinkled with a little black. Another exhibits close to the end of the inner border, a small grey stripe; the edges (or fringes) of all the wings are more clearly speckled *(gescheckt)* with white than in the case of the ♂, although

not so perceptibly as in *Nephereus*. *Plateni* has otherwise all portions of the body of the same form and colour as *Nephereus*, especially the red collar and red spot on the breast, and also the black upper part of the abdomen (in 2 ♀ ♀ of black grey) and the under yellow part with very distinct black dots, especially in one ♀. If a large number of *O Plateni* ♂ ♂ should later on exhibit on the upper sides of the secondaries more yellow patches than the present specimens, this would advocate (*'sprechen'*) its being a Palawan form of *Nephereus*, therefore the present ♂ gives the impression of a quite remarkable species."*

♂. The red collar of this species is very narrow, and the red of the breast is not so extensive as in some other forms. On the metathorax it forms a moderate-sized red spot; a minute red spot impinges close to the back of the pre-costal nervure; the red then continues in an interrupted narrow line across the mesothorax to the base of the costa of the upper wing, to re-appear on the upper side as the red collar—(the exact form of which I will figure in another section of this work).

The abdomen is of a shining bluish-black on the upper side, becoming brown towards the anal extremity, where it tapers off to a point as it leaves the last segment of the abdomen, showing the delicate ochraceous grayish-white which is the prevailing colour of the anal extremity beneath. The underside of all the segments is a fuscous-greenish yellow, the yellow scales of the 1st segment being more lemon colour, as are the longer scales or hairs of the sub-dorsal portion. The thorax is quite black; the eyes are red-brown, the space between velvety-black. The length of the costa 67; of the hind wing 38; width of front wing 40; and of hind wing 28 mm. Length of antenna and abdomen 27; of thorax with the head 18 mm. Length of legs

1st pair, femora 10; tibia, 8; tarsi, 12 mm.
2nd ,, ,, 11; ,, 11; ,, 13 mm.
3rd ,, ,, 10; ,, 11?; ,, 12? mm.†

Articulations of antenna 44.

♀. No red collar. The red spots of the breast are two in number, moderately large, and triangular on metathorax; larger, but same shape on mesathorax, not reaching quite to the base of the costa of the upper wing. The abdomen above is of a soft light-fawn brown, in singular contrast and harmony with the wings; laterally it is a subdued white, more yellow on 1st segment, slightly fawn-tinted at anal segment; the subdorsal parts are more yellow, with longitudinal black cloudings and segmental black dots distinct from the cloudings on the last four segments, but coalescing with them on the others. The thorax and collar are a mixed light and dark brown, the edges of the tegulæ darker than the rest. The length of the costa 76, width 40, length of hind wing 46, width 33 mm., of antenna and abdomen 27, and of thorax, including head 20 mm. Of legs

1st pair, femora —; tibia, —; tarsi, — mm.‡
2nd ,, ,, 11; ,, 11; ,, 15 mm.
3rd ,, ,, 10; ,, 12; ,, 15 mm.

Articulations of antenna 52.

It is only when we examine the underside of the ♂, with its resemblance to the ♂ of *Nephereus*, and notice the still closer likeness of the ♀ to that of the latter also that we are able to regard this form as being possibly a local var. of *Nephereus*. The appearance of the *upper* side of the ♂ would certainly lead us to a different conclusion.

Hab. Island of Palawan, Philippines.

I am indebted to Mr. Walter Dannatt, who received it from Dr. Staudinger of Dresden, for the opportunity of figuring this species; his specimens being good and valuable typical examples.

♂. (In the collection of Mr. A. H. Grose-Smith) has a rather more extensive area of yellow in the secondaries, extending over half the width of the space between the 2nd sub-costal and discoidal nervules, and a small portion of the space within the discoidal cell,—or 12 mm. at its broadest, 10 mm. at its narrowest, and 26 mm. at its greatest length. On the undersides of the same wings, the scattered black and yellow atoms, so well exhibited in Mr. Dannett's example, between the 2nd sub-costal, the discoidal and median nervules are as nearly as possible absent, the whole space within the borders being a nearly immaculate lemon yellow. If this specimen be looked at in the same way as when we examine the Philippines species, *P. Magellanus* for its wonderful opalescence, we shall see an almost equally beautiful change, for the yellow will give place to the most brilliant warm emerald and veronese green. This effect is *not* so well defined in Mr. Dannett's specimen; on the other hand if the yellow be viewed with transmitted light under favourable circumstances, it appears so intensely brilliant as to suggest, as Mr. Grose-Smith remarked when we were examining it, the intensity of the electric light! Length of costa 67 mm.

Habitat, Palawan. Received from Dr. Staudinger.

♀. (Also in the collection of Mr. H. Grose-Smith.) The upper surface of primaries does not differ from the example figured; secondaries, a small semilunate black-atomed yellow spot on the black border between the 1st and 2nd sub-costal nervures, similar to those found on the ♀ of *Nephereus*. In no other respect is there any variation. Length of costa, 85 mm. Hab., &c., as above.

The type of each sex is in the collection of Dr. Staudinger.

* Translated from Dr. Staudinger's Paper in the "Correspondence-page of the Entomological Society '*Iris*' in Dresden." No. 5, July, 1888, page 274.

† The tibia and tarsi were lost, so the measurements are only provisional.

‡ The first pair of legs was lost.

POMPEOPTERA DOHERTYI.

Ornithoptera (Pompeoptera), Dohertyi, *Rippon*, Annals and Mag. Nat. Hist., Vol. II., p. 295, 1893.

This most important and interesting novelty, discovered by Mr. Doherty in the Island of Salibobo or Lirung, one of the Talautse Islands* may ultimately throw much light on the phylogenetic history of the genus ORNITHOPTERA inasmuch as it may be regarded as one of the transitional forms, some of which have probably long since perished, which would enable us to link together in a natural series all the many nominal species which we find it necessary to admit into its subgenus *Pompeoptera*, and even to suggest, on the side of the female at least, a closer relationship with the *true Ornithoptera* than at one time might have seemed probable.

We owe a debt of gratitude to Mr. Doherty for the faithful and admirable work he has for a long time been doing among the islands and islets of the Malay Archipelago. In this respect he has been rapidly entitling himself to be regarded as a second Wallace. The novelty which is now before us appears to me to be one of the most useful contributions to the Rhopalocerous fauna which he has been enabled to send to us.

I have therefore had much pleasure in dedicating this new species to him, partly at the suggestion of Mr. Elwes, and partly because I think it is right to give what honour we can to those who faithfully spend their health and energies in difficult regions of the earth, for the purpose of discovering those lovely things which furnish us with fresh materials for one of the most delightful studies, and with an increased knowledge of God's works.

♂. Primaries an intense silky black, almost like a burnished black, with a faint green gloss in certain lights, which gives it an exceedingly rich appearance. The grey discal rays which enclose the nervules are so obscurely represented as to be scarcely visible except when the light is transmitted from the underside. The veins are all well expressed, being somewhat lighter on the dark and much darker on the light parts of the wing; the costa is also of the same tint, especially near the apex when viewed opposite the light ; the costal outline is nearly straight to two thirds of its length or at the termination of the costal nervure when it curves considerably to the apex, which is so much rounded as to pass insensibly into the posterior margin; the outline of the posterior margin curves somewhat irregularly, with an outward trend much greater in proportion at the termination of the second and third median nervules than at any other part, not excepting the apex ; it is very delicately and equally sinuate along its entire outline, with very fine reddish-ochreous fringe-lunules between the veins as usual.

Secondaries entirely glossy black, slightly greenish or bluish according to the position in which they are viewed; the veins sufficiently defined in a lighter tint; the abdominal marginal sexual pouch or fold is a faintly redder black; the posterior margin regularly and sufficiently scalloped, and without the white fringe-lunules. Hence the entire upper surface of the wings is absolutely immaculate.

Under surface of primaries velvety or silky black, less dark and more glossy towards the posterior margin; within the discoidal cell, at the termination of the third *pseudoneurus*, are a few scarcely visible grey atoms; the discal grey rays enclosing the nervules are strongly defined in a slightly greenish grey, rendered darker by a graduation with black atoms towards the cell; the rays between the third and fourth subcostal nervules are only faint streaks of grey, and only one occurs on the upperside of the third median nervule ; the posterior margin almost entirely outlined by the white fringe-lunules, which at the apex slightly encroach upon the costa; veins strongly defined. Secondaries a deep silky black; the abdominal fold or pouch browner, with a fringe of delicate hairs as long as the width of the pouch ; the discoidal cell immaculate; between the first and second subcostal nervules is a subquadrate patch of yellow atoms; between the second subcostal and third median nervules a broad discal band of lemon-yellow, forming four subrectangular patches of unequal length, strongly divided by the nervules, the first broadly indented from the direction of the cell, sinuate without, the second indented outwardly and enclosing an elongate black spot, which nearly divides the yellow area, the fourth lunate without and sharply indented above ; viewed obliquely with a side light this yellow band becomes a rich emerald-green, not unlike the green of the typical *Ornithoptera* ; the hind margin is without the ochreous fringe-lunules.

Head: antennæ black; eyes chesnut-brown; haustellum silky black. Prothorax with a crimson collar; thorax above velvety black, beneath deep black, with lateral crimson spots ; legs black. Abdomen pale brown, bordered with piceous brown; the first segment entirely piceous brown, the subanal segment also of the same colour, margined with creamy white; the anal valves creamy white, with the usual dorsal black termination ; laterally the abdomen is of a creamy ochreous white; subdorsal slightly yellower at its junction with the metathorax, more ochreous near the anal valve, the first and second segments well divided by black; the lateral black dots fairly large.

The space of wing enclosed by the two branches of the precostal nervure is more equal in width than is usual till it reaches its junction with the subcostal nervure, when, of course, it becomes narrower. This is really a

*There seems to have been a misunderstanding as to the exact nomenclature and position of the Islands in which Mr. Doherty discovered this and other species of Lepidoptera; for, in a letter of his, he says, "I see the Proc. Zool. Soc., 1892, calls *Sangir* and its surrounding islets the 'Talautse Islands,' following a blunder of Forbes. There is no other name for this group than the *Sangir Group*; and some people call Sangir 'Groot Sangir,' to distinguish it from the others.

"The other islands lie in deep sea, 100 miles East, and have a wholly different fauna. Their Malay name is *Talaut*, the local name *Talaur*, and some old English charts call them *Tulur*. My new Ornithoptera is from Lirung or Salibobo, one of this latter group."

To Mr. Doherty's remarks I would add that, according to James Wyld's chart, these islands are called the Salibabo group, and are situated about 75 or 80 miles nearly due east from the Sangir group, with a slight inclination north. In another of his charts they are called the *Talautse Islands*, but the distance is about the same. They appear to be distant from the nearest point of Djilolo about 30 miles, and from Morty Island, rather less—being situated N. of the former, and North with a slight inclination E. of the latter: they are also about 70 miles S. of Mindanao with an eastern inclination. The seas bounded by Borneo, the Philippines, Celebes, and the curve extending from Java to Papua, or New Guinea, are simply crowded with islands and islets: all, or nearly all, of which may be expected to furnish us in the future with many more valuable novelties in every department of zoology, and probably many new forms of Ornithoptera. The Researches of Wallace, Doherty, and others have probably done little more than to provide us with a good hope of many wonders yet to be revealed.

very striking character, the nearest resemblance to which is found in the male of *Pompeoptera hephæstus* so far as I can discover; it is also nearly as rectangular in the female.

Expanse of costa 69 millim.; width of upper wing 57; length of hind wing 44, width 31; length of abdomen or antennæ 31; of legs, first pair, femur 12, tibia 9, tarsi 12; second pair, femur 12, tibia 12, tarsi 15; third pair, femur 11, tibia 13, tarsi 15 millim.

♀. Primaries: costa equally arched but more rounded at the apex, the outline insensibly passing into the posterior margin, which is not so irregularly curved as in the male; inner margin nearly a straight line. Wings light fuscous brown: within the discoidal cell are faint atomic indications of grey markings somewhat like those of the female of *P. haliphron*; the grey discal rays very indistinct except those enclosing the first and second median nervules (which are fairly though faintly defined), broadly separated by the brown margins of the nervules; the *pseudoneura* are only just visible; posterior margin with whitish fringe-lunules. Secondaries slightly darker fuscous brown; within the cell a faint ochreous rufous-yellow spot close to the discocellular nervules; four very short narrow rufous-yellow discal marks, the first 6 millim. long, close to the second discocellular nervule, the second the same length from the cell, the space between the second discocellular and first median nervules broadly incurved and (on the right wing only) enclosing a small brown dot; the third 7 millim. long from the cell, indented two thirds its length, enclosing a brown spot (on the right wing); the fourth 5 millim. long from the cell, indented (on the right wing only about half the size); extremely faint indications of a submarginal band of small spots; the submedian area of wing is clouded pale reddish ochreous, meeting an anal, angular, ochreous, sublunate spot, from which two rays run partly up the abdominal margin; margin sufficiently scalloped, with ochreous fringe-lunules.

Under surface: primaries the same colour as above; the grey rays and discocellular markings similar but much broader, a brighter ochreous red at the outer margin, greenish grey towards the base and confluent between the second discoidal and second median nervules; the marks within the cell are formed of microscopic atoms, and are divided into three submarks—the first broad, one third of the cell in length, the second very narrow and divided by the second *pseudoneurus*, the third or lower one nearly as broad and long as the first and divided by the third *pseudoneurus*; the marginal fringe with a nearly continuous row of ochreous lunules. Secondaries same colour as above, but slightly darker; a large discocellular pale spot clouded with atoms close to the discocellular nervules; the discal marks corresponding with the four on the upper surface are much paler and extend much further down between the nervules—the first is partly pure and partly formed by atoms, the second is indented with brown, modified by atoms, the third much larger and with a large brown indentation, and the fourth very long, but so interrupted with brown modified by atoms as to form an ochreous ray close to the nervules extending nearly to the marginal border; outside the third median nervule is also an ochreous atomic ray close to the nervule, almost hastate, followed by a second longitudinal stripe extending lower down nearly to the outer margin; the submedian nervule and the abdominal margin have similar ochreous stripes as above, but more prominently developed; there is a broad submarginal band indicated by narrow ochreous stripes and cuneiform spots, so meeting and enclosing the brown areas between the nervules, especially from the second subcostal and third median, as to give them almost the appearance of arches, the bases of which are the fringe-lunules of the posterior margin.

Head: antennæ deep black; eyes chestnut-brown; haustellum black. Thorax and prothorax dark brown, with crimson collar; lateral crimson spots, and subdorsal with less black. Abdomen pale fuscous brown, with lateral borders of reddish ochreous; subdorsal the same, with strongly outlined or entirely fuscous brown segments; anal tuft dark brown.

Expanse of costa 82 millim.; width of upper wing 61; length of lower wing 51, width 45; length of antennæ or abdomen 31, of thorax with head 21. The legs, all but one, are absent from the specimen.

By my acquisition of a good series of the ♂, and a few examples of the ♀ since the above description was written, I am able to show that this species is subject to a series of variations of a definite and fairly constant character; it evidently being possible to meet with a good many examples of each type of variation. These types of variation are two in number in the ♂, and three in the ♀, and they almost approach the appearance of dimorphison or trimorphison. A reference to the two plates accompanying this description will make my meaning plain.

In the coloured plate, fig. 3, and in the plain plate, figs. 1 and 4, represent the first type of variation in the ♂. The upper surface of the wings in all specimens is immaculate black; but the under surface of the hind wings has a broad, yellow band of varying width. This band differs little in any of the examples of this type. In fig. 9 of the coloured plate, and figs. 2 and 3 of the plain plate, the yellow band is narrower, more irregular in outline, and always more or less interrupted by the black—some of the divisions being rendered almost obsolete by the black atoms, or by a few yellow atoms on the black.

The 3 types of variation in the female are also fairly constant. The coloured plate, figs. 4 and 5, and the plain plate, figs. 7 and 9, exhibit the first type. The upper surface of the hind wings has only a small discal patch of light colour close to the nervures, divided by the nervules, and also slightly encroaching within the cell, with a row of submarginal small spots, divided by the nervules; in fig. 7 of the plain plate these spots are absent. The under surface of these wings with a similar plan of markings, but larger—the submarginal spots of the coloured fig. forming quite an arched band. The 2nd type of variation is seen in the plain plate, figs. 5 and 8. The upper surface of wings is quite immaculate, and the under surface of all the wings with a more extensive series of light markings, the light rays of the upper wings filling the greater part of the disc. Fig. 10 is a smaller example of this type, with less pronounced markings. The 3rd type is seen in fig. 6 of the plain plate. The under surface of the Primaries has nearly the whole of the disc and 1-3rd of the cell whitish; the secondaries with slight discal and cellular marks—the former as white lines enclosing the nervules to about midway from the cell to the outer margin; and a broad submarginal mottled band of ochreous whitish of great beauty.

The 1st type of variation in the ♀ allies the species with *Pompeoptera iris*, Robur; the 2nd type gives the black markless ♂ a dark and unspotted ♀.

Greatest length of costa of the ♂ 73 mms., least length about 64 mms.; of ♀, greatest length 80 mms.; least length, 60 mms.

In the museums of the Hon. Walter Rothschild ♂ and ♀, the Author, ♂, Mr. H. J. Elwes, ♂ and ♀, Mr. H. Grose-Smith, ♂, M. Oberthür, and others.

Hab. Lirung or Salibobo, *Talautse* Islands (*Doherty*). Feb. to March 1892.

Setting aside the remarkable precostal character of the male, which allies it to *P. hephæstus*, the nearest affinity of the male is with *P. Plateni* on the upperside, appearing like an immaculate var. of that Philippine species. On the under surface of the lower wing the yellow marks suggest an approach to those of *haliphron*; the female also on the upper wing, and somewhat on the under surface, comes nearer to the *haliphron* facies*. The outline of the male primary wing is unlike that of any other; nevertheless we have in this species a close ally of *Plateni* and possibly an old form from which perhaps several of the varieties of the *haliphron* and *helena* groups have been derived by differentiation—a transitional species, the discovery of which I have long anticipated. After awhile other transitional forms will, I hope, be found, and we may then be able to understand some of the geographical development history of the genus.

* Since writing the above I have been able to compare the females with a female of *Pompeoptera iris*, Röber, in the rich collection of the Hon. W. Rothschild, and am struck with the resemblance of one or two examples of *P. Dohertyi* with the latter.

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POMPEOPTERA MIRANDA.

Papilio Miranda, ♂, ♀, Butler, "Lepidoptera Exotica," I. p. 3, t. 1 (♂), (1869).
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An inhabitant of Borneo. But though found in other parts of this large island its range seems to be chiefly confined, as far as we at present know, to the North-west portion of the island, in the rich zoological province of Sarāwak (or between 1° and 2° north latitude, and 109° 40′ to 111° 40′ east longitude), and also to the small island of Labuan (which with Sarāwak, are valuable coaling stations for British ships), situated near the north-west coast of Borneo, at a distance of about 30 miles to the north of the town of Borneo, in 5° 22′ north latitude, and 115° 10′ east longitude. These districts may, therefore, be regarded as the Metropolis of the species.

The interior of Labuan, which is about 70 miles long, and 7 in breadth, contains extensive tracts of swampy jungle; while the jungles and forests of the province of Sarāwak are also well watered by the river Sarāwak and its tributaries, as well as by the heavy rains which fall both in Borneo and Labuan at certain seasons—one of the consequences being that the insect fauna, at least of Borneo, is exceedingly rich, enormous multitudes of species having been discovered already (often of great size and beauty), with a splendid prospect of a very large future addition, when the island has been more fully explored and examined. Its Ornithological glories are also very numerous: and the same may be said of its conchological treasures, which number among them such a fine shell as the sinistrorsal *Helix Brookeana*. The mineral deposits of Sarāwak are also rich in gold, copper, iron, antimony, and coal.

This large and striking insect is in many respects a worthy rival of *P. Magellanus* by its beauty and size, but especially for the remarkable rich purple gloss which may be seen to overspread the central portion of the front wings of the ♂, when viewed in certain positions—all the more wonderful and beautiful because the wings are apparently a dense black: for it is more difficult to discover the exact position in which the gloss is visible than it is in the case of *P. Magellanus*, chiefly because it is not always equally intense in every example which I have had the opportunity of examining: and indeed a row of these butterflies might be viewed by any number of superficial observers without this character being discovered or even suspected to exist. In some examples this purple glances over the entire wing area, but it is generally most dense at the middle of the wing; and does not occur on the under surface, as the opalescence does in *P. Magellanus*. The hind wings in certain positions have their yellow area shot with a delicate emerald green—a feature common to the yellow of several other species, notably *P. Vandepolli* and *P. Honrathiana*.

If *P. Magellanus* may be regarded as the Royal Ornithopterus of the Philippines, P. Miranda will merit as high a rank for Borneo, or at any rate will closely compete with *T. Brookeana** for beauty.

I will first avail myself of Mr. Butler's original description of this species in his "Lepidoptera Exotica," and afterwards add such additional observation as may seem necessary.

"♂. Alæ anticæ nigerrimæ, certo situ nitide cærulescentes; striis tridecim (quarta elongato-lunulari) de quarta submarginalibus, decrescentibus, flavidis; ciliis flavo interruptis; posticæ flavæ nitidæ certo situ minime virescentes, margine bruni nigro, externo sex-elevato, venis nigris; corpus nigrum, abdomine flavescente. Alæ anticæ subtus regione apicali, sericea, striis supernis albidus; alster velut supra; corpus thorace nigro, abdomine flavo valvulis albides; exp. alar. unc. 6, lin. 4.

"♀. Alæ anticæ supra brunneæ venis nigris, striis velut mari positis sed albidus; posticæ flavæ nigroirroratæ, basi, margin, fasciaque maculari discum fere totum obtegente, sericeo-nigris: corpus nigro fuscum collo flavo, abdomine paulum pallidiore lateraliter flavo squamoso. Alæ subtus charateribus multo distinctioribus, aliter velut supra; corpus thorace nigro, abdomine flavo, hoc fusco sex-fasciato; exp. alar, unc. 7, line 5, Sarāwak, Lowe ♂ ♀ Brit. Mus."

*It will be remembered that *Trogonoptera Brookeana* was first discovered in Sarāwak by Mr. A. R. Wallace, though it was subsequently found to be tolerably abundant also in Sumatra.

The following is my own description of this species from the examples figured on Plates 66A, 66B, and 66C, the originals of which are in the rich Rothschildian collection at Tring :—

♂. Anterior wings intensely black, though shaded to a slightly lighter tone towards the outer margin ; this black is shot or suffused with a rich violet glow, which can only be seen, when held in a certain position ; though very difficult to be detected, it is nevertheless quite vivid when discovered, and the glow of violet travels over the wings almost from the base to the discal adnervular rays, being even faintly visible over towards the outer margin, as the insect is slowly moved by the hand ; the glow does not extend above the subcostal nervure, or below the submedian vein, or only very faintly ; a discal band of whitish adnervular narrow rays commences at the 2nd median nervule and continues up the wing almost to the costa, curving inwards in position, and away from the anterior angle, becoming faintly yellow as they approach the costa, and yellow also at their inner ends. There are about 10, 11, or 12 of them in all, for they slightly vary in number in different examples of the species. The marginal interrupted ciliæ are slightly yellowish white, and only faintly shown. The veins and discal folds are fairly prominent, the pseudoneura of the cell only faintly seen.

Posterior wings rich silky golden-yellow, with a very faint delicate green tinge towards the base ; the base velvety black, and black outside the precostal nervure which colour unites with the abdominal marginal black, and also extends to the anal angle—the abdominal fold is slightly accentuated down the middle of this black area ; the posterior marginal black band extends from the apex to the anal angle, and consists of 6 crescentic divisions of moderate breadth ; the outline of wing is crescentic, with yellowish white very slight marginal lunations ; all the veins are intensely black, and a number of delicate faintly dark hairs intrude from the base into the yellow of the wings.

Under surface of anterior wing as above—the violet glow being quite as rich as on the upper side of the wings ; but the black of the wing is less dense, approaching more nearly a warm dark-brown ; the white adnervular rays on the disc are a little more prominent and with less yellow. Under surface of posterior wings exactly as on the upper side.

Head, antennæ and thorax velvety black ; eyes brown ; abdomen, except the anal valves, greenish lemon-yellow, with a broad longitudinal dorsal brownish-red band slightly suffused with violet. A subtriangulate black mark on the anal and penultimate segments ; the anal valves pearly white, and the dorsum yellow, with the usual row of lateral black dots ; the legs brown black ; and there is no lateral red patch on the thorax, as in other species.

Length of costa, 79 mms. ; greatest width of anterior wing, 51 mms. ; least width, 5 mms. Greatest length of posterior wing, 54 mms. ; greatest width, 35 mms. Length of abdomen and antennæ equal, or 31 millimetres each ; length of thorax and head, 31 mms.

Length of legs : 1st pair : femur, 8 ; tibia, 9 ; tarsi, 12 mms.
2nd „ : „ 10 ; „ 11 ; „ 15 „
3rd „ : „ 9 ; „ 9 ; „ 14 „

Habitat. Sarāwak, Sandakan, North Borneo.

♀. Light form. Anterior wings, warm brown—slightly darker at the base, and at the outer margin ; the veins all black and prominent ; a submarginal, or rather discal transverse row of short white adnervular rays, of which those on the 3 median nervures are short, the next above longer, and the others beyond to the subcosta longer and more or less nebulous ; two short rays are also on the submedian vein ; the submedian and submarginal folds are fairly prominent ; the pseudoneura in the discoidal cell are also faintly expressed. Posterior wings black, with a submarginal or discal band of yellow marks—those on the 2nd and 3rd median nervules rather large, widely separated from each other by the black of the wing, curved at the sides, obtuse above, and indented below : the remainder to the anterior angle continuous, lunate above and below ; and 2 or 3 slight small triangulate spots at or towards the anal angle—one of them being whitish, the outer-marginal lunations are slight and ochraceous white ; the abdominal fold, and the space between the 3rd median and submedian vein with nebulous yellow white scales on the black ; the base of the wings to nearly 1-3rd of the cell black ; the rest of the cell and nearly 1-6th of the disc are yellow, the discal yellow so indented by the black of the disc as (with the submarginal yellow marks above described) to give the black the appearance of a broad central band of very large subovate marks or black cones between, curving upward between the veins, as we see in many of the other forms of the genus Pompeoptera ; the veins are all very black and prominent on the yellow ; and a tuft of faint dark hairs originates at the base and slightly encroaches on the yellow of the cell, so as to subdue its intensity.

Underside of ♀. Anterior wing similar to the upper surface, but the white rays are all broader, a little longer, and slightly whiter ; with a few nebulous white atoms on their inner ends ; a white nebulous mark is on the discocellular nervule outside and inside the cell ; posterior wing as on the upper surface except that the submarginal or discal band is entirely continuous, and the veins as they pass through the black discal area are edged with yellow, thereby forming a distinct discal band of black (almost) pear-shaped marks or cones ; abdominal margin with yellow and whitish stripes and small spots.

Head, antennæ, and thorax velvety black ; eyes brown ; pronotal collar yellow ; abdomen with broad warm brown ; dorsum, shaded on each side by black, the margin of the dorsum are greenish yellow, subdued by black atoms, and the annulations are well defined by black.

Abdomen slightly longer than antennæ, or 34 mms. ; thorax and head, 21 mms.

Length of legs: 1st pair : femur, 9 ; tibia, 9 mms ; tarsi, 12 mms.
2nd „ „ 12 ; „ 13 „ „ 13 „
3rd „ „ 11 ; „ 11 „ „ 11 „

Length of costa, 100 mms. ; of outer margin, 70 mms. ; of inner margin, 55 mms. ; greatest length of posterior

wing, 72 mms.; greatest width of wing, 47 mms.

♀. Dark variety. Anterior wing as in the type form, except that the colour is light rufous brown, darker shaded at the outer margin beyond the adnervular rays; the rays are regularly arranged from the anal angle to the subcostal vein, and are a very subdued white; the veins very prominently black.

Posterior wings as in the type form, except that the yellow areas are much restricted, and even then greatly subdued by black atoms or scaling.

The undersurface of the anterior wing warm rufous brown, darker at the base and near or beyond the rays; adnervular rays as above, but very white and prominent, subdued in the direction of the cell by dark atoms. Posterior wing as above, except that the yellow areas are slightly larger, and more vivid, but shaded by black scaling.

Head and thorax as in the type, except that the pronotal collar is not yellow; abdomen as in the type, but with more subdorsal back, all the yellows also subdued by scaling.

Length of costa, 101 mms.; outer margin, 70 mms.; greatest length of posterior wing, 72 mms.; greatest width of wing, 49 mms.

Habitat: Sandakan, N. Borneo.

In the museum of the Hon. Walter Rothschild, at Tring.

I have seen a considerable number of examples of this species, and find that except in gradations of tone between the type form and this dark variety, very little difference is to be observed between them. By careful examination of the different examples a slight tendency may be detected towards a violet suffusion of the wings of the females; but it requires a good pure light in order that even this may be faintly seen.

This species is figured on plates 66A ♂, 66B ♀, and 66C ♀, dark form.

As I have shewn in another place, the beautiful opalescent tints of the ♂ *P. Magellanus* are sufficiently repeated on the wings of the ♀; in the case of *P. Miranda* only a very slight tendency towards a repetition of the violet sheen of the male can be discovered; but one need not be surprised if ultimately some highly coloured varieties of the ♀ may be met with, or produced by careful breeding. This anticipation is somewhat justified when we consider how prevalent ultramarine and azure blues, and violet tints are among the Rhopalocerous and Heterocerous Lepidoptera, either as wing colours, patterns, or suffusions on the darker or browner areas of the wings, especially on their upper surfaces.

This fact applies especially to the Lepidoptera of South and Central America, and in a more limited degree to India and Borneo, the Philippines, the Malay, and Moluccan Archipelagos, New Guinea, and its Papuan Islands. So remarkably numerous are the examples on the two American Continents, that one is almost tempted to regard blue and violet as the prevailing colours of the lepidopterous fauna. A very large proportion of the Lycænidæ and the Theclas, especially of America, are more or less blue—often in both sexes; many of the Erycinidæ have violet reflections, especially in the Genera *Ancylurus* and *Erycina*; the ♂ ♂ of the majority of the Morphos are of vivid blue and greenish blue tints—and also a considerable number of the Morphinæ of the east, and the dark satyridæ of nearly all countries; indeed it may be safely assumed that two of every three species of the dark brown satyridæ are more or less beautified by either a sheen, or by violet or blue reflections on the wings of one of the sexes, and the darker the insect the more easy are their tints to be detected. A multitude of the Nymphalidæ, such as *Catagramma*, *Eunica*, *Cybdelis*, *Callithea*, *Prepona*, and *Agrias* (in the latter combined with scarlet or crimson); and a large number of the oriental Euplœas are shot with blue or violet; many of the oriental Papilios, (*P. Ulysses* and its allies for example, are grand blue species); a very few of the *Pierinæ* are delicately tinted; but there are many Hesperiidæ that are either intensely coloured, or their black or brown surfaces give off violet reflections when viewed in the proper positions. The same may be observed among many of the Noctuidæ of India and South America, notably among the gigantic Erebidæ, and several of the oriental allied genera. Among the Ornithoptera the tendency is for the black of many of the species to exhibit at least a faint sheen of blue, often shading into olive greens, as the specimens are changed in position.

But it is interesting to note that the green marks and areas, especially of the anterior wings of the latter insects always appear with coppery or crimson scarlet reflections, when viewed obliquely against the light; in some species this colour reflection is so vivid as sometimes to give the species the aspect of *O. Croesus* ♂, and to strongly suggest that the whole of the species of my genus Ornithoptera have originated from either a green or an orange ancestor. It must also be noted that in most of the ♂ forms even the golden greens on both surfaces appear to flow into blue or violet when moved about into the proper light and positions; and that on the under surfaces of the posterior wings the greenish-white areas often exhibit a blue blush.

This brings me therefore to offer a suggestion that has been on my mind for some years; and though it may seem to be a little out of place in this work, I am sure I may be excused for bringing it forward, because of what I conceive to be its scientific importance.

A very large proportion of the lepidoptera are capable of an almost infinite tendency to variation, as we well know. Indeed there are only a few species that appear to be quite stable—*i.e.*, that appear to retain exactly the same pattern and colours from generation to generation, in whatever locality they may be found. These evidently are dominant protected species, generally brilliant and conspicuous in colours and patterns, of strong or erratic flight, capable of living almost in every part of the globe: such species as *Danais archippus*, *Pyrameis atalanta*, *P. Cardui*, &c., are examples (*P. Cardui* is generally shot with violet in the examples taken in India and South Africa, pretty much in the same way as are some of the species of Colias

and Meganostoma among the Pierinæ.) But many species are so sensitive to the almost imperceptible changes of local climate and environment, as to be most unstable, as if they were constantly striving to adjust themselves to the ever changing conditions, with the result that no two specimens of the same species are quite alike in pattern or colours.

Well then, seeing that a boundless variety of beautiful forms and colour-patterns have during the past century been evolved in the vegetable and animal kingdoms by artificial or mechanical selection and various other scientific methods, by which the most glorious and marvellous beauties have resulted, presenting to our contemplation what sometimes seems like a new creation, it has often been impressed upon my mind that if our collectors in exotic countries could devote a portion of their time to the breeding by artificial selection of the lepidoptera, especially the more unstable species, adopting as much as possible the methods pursued by Florists, and the breeders of Fowls, Pigeons, &c., it would be possible, within a measurable period, to produce forms among the lepidoptera more wonderful and beautiful than anything yet dreamed of; and it would be especially found that the colour reflections referred to above, would become intensified, and textures would be so modified and perfected, as to bring about the most startling results —almost or quite equal to the creation of new and more wonderful species. That this is no mere unsupported theory, we may remind ourselves that even among British and European lepidoptera some most interesting and suggestive results have been attained by those entomologists who have experimented in this direction.

By these methods we might safely anticipate a great accession of information relative to the laws by which the differentiated forms which we are acquainted with have been evolved. With regard to the Ornithoptera much might thereby be learned. Some species, as I have shewn in the first volume of this work, vary so remarkably that it would be quite imprudent to assume that we have as yet become acquainted with all the possible or existent aberrations of them. *O. Richmondia* and the series of forms belonging to the *Poseidon* group are illustrations of this; the variations of colour between *O. Aruana* and *O. Urvilliana* are other very suggestive facts; the tendency among the variations of *O. Poseidon* on the anterior wings for the green colours and marks to occupy an increasing area of the wing, also seems, as I have shown, to suggest the possibility of a form in which the whole of the wing would be green, except perhaps a small portion of the subcosta and the outer margin. Then again we have among the species of the genus Pompeoptera the case of *Dohertyi*, where the ♂ is entirely, or almost entirely, black, and some of the ♀ ♀ quite immaculate and unicolorous.

Surely these phenomena, not to mention the numerous instances among the other groups of Lepidoptera, are a strong hint to us of what we may find possible by artificial selection and breeding. At any rate, even if there were great difficulties in carrying out my suggestions (and there would be), they would not be insurmountable to an intelligent, ardent, and persevering naturalist, and they would amply compensate all who engaged in the undertaking, besides adding largely to our knowledge of some the most deeply interesting phenomena of Nature.

As will be remembered, I called attention in Vol. I. to the singular fact that all the examples of *O. Crœsus*, ♂ that were bred in confinement proved to be of a brighter orange than those captured by Wallace and others; for many of the latter were often of a red orange, almost as fiery as that of the ♂ of *O. Lydius*. And whilst the colour reflections of the posterior wings in the captured examples are usually of a deep olive green tint, those of the artificially-bred examples are generally emerald green, often so vivid that in some positions the insect appears to be emerald green rather than orange!— a somewhat analogous phenomenon to that of *Pompeoptera magellanus*.

I might suggest *en passant*, that the experiments in artificial breeding and selection, if they could be applied to Humming Birds, Trogons, and Birds of Paradise (and there is no reason why this may not be done some day) would bring about results even more wonderful and startling than among the lepidoptera.

POMPEOPTERA DOHERTYI.

Additional Bibliographical References to Page 67.

Ornithoptera Dohertyi, W. F. Kirby, Nature, V. 51, p. 255 (1895).
Troides Dohertyi, Rothschild, Novitates Zoologicæ, V. II., p. 227. n. 22 (1895).
Papilio Yordermanni, Snellen, Tijdschr, V. Ent. xxxvii., p. 191 (June, 1895).

POMPEOPTERA DOHERTYI.

Var. *fasciculatus*, Rothschild.

♂. Anterior wings exactly like those of the type form. Posterior wings also like those of the type. Under surface of anterior wing, with the cell, costa and subcosta, and all the area below the 3rd submedian branch black; the remainder of the disc dull grey white, tinted with black green, shaded towards the cell with black atoms, and also into the very narrow outer marginal black by similar atoms. Posterior wings, similar to those of the type form, except that the yellow discal band is much broader, and purer, and faint spots composed of grey yellow atoms are on the black of the last two divisions of the submarginal border. The colours of the abdomen vary very little from those in the type form. Length of costa 63 mms.

♀. Anterior wings rufous-brown; the distal 3rd of the cell, dull ochraceous grey, almost shaded into brown; all the disc except 1-3rd between the 2nd-3rd median branches, and nearly the whole of the rest of the wing below this, with the same subdued ochraceous rufous-greenish-grey tint, almost clouded into the upper part of the wing by rufous-brown; the outer margin very narrow and brown, interrupted by the ochraceous fringe lunations. Posterior wing dark rufous-brown, with two small rufous-yellow spots close to the cell, and the greater part of the submedian fold and abdominal-marginal space rufous-yellow, the fringe lunules and submarginal cloudings of the same tint, produced by light atoms. Under surface of anterior wing, with the disc (all but a portion of the area below the 2nd median branch), a silky (somewhat luminous) rufous-yellow-white; and with the distal 3rd of the cell of the same colour; the rest of the wing rufous-brown. Posterior wing silky dark brown; with distal 1-3rd of cell and a nebulous light discal cloud from the outer side of the 3rd median branch to the 1st discocellular nervule (and occupying nearly or quite 1-4th of each internervular space) all composed of rufous light-ochraceous atoms; also with a broad clouded submarginal band of rufous ochraceous white; the submedian fold and part of the abdominal margin streaked with the same tints.

Head, antennæ and thorax black; eyes rufous-brown; abdomen with dorsal broad rufous-brown, bordered by dull rufous-white; lateral portions a little more ochraceous —the lateral black dots larger than usual, and the subdorsum quite dark brown. The eyes in both sexes underlined with red, and the lateral red spots of the thorax as usual also in each sex.

Length of costa 75 mms.; greatest length of posterior wing 58 mms.; greatest width 37 mms. Length of thorax with head 22 mms.; and of abdomen or antennæ 28 mms.

Habitat, Waterstradt, Talaut Islands. Pl. 64A, Figs. 1 ♂, 2, 3 ♀.

The ♀ is almost entirely like the variety figured on pl. 64, fig. 6, so far as the underside is concerned; and appears to be a representative of my 3rd type of variety of the species. It is also sufficiently distinct from all the other varieties to constitute a sub-species of Dohertyi.

POMPEOPTERA ANDROMACHE.

Ornithoptera Andromache, Staudinger, Iris, Tab. viii., ♂ and ♀, Band 7, Heft. 2, p. 341, (1894).
Troides Andromache, W. Rothschild, Novit. Zool., Vol. II., p. 228, n. 24, (1895).

♂. Primaries entirely velvety-black; nervules obscured by the black; with a transverse light shade, modifying a part of the discal black, caused by the marks of the undersurface being slightly transmitted through; undersurface black, much lighter towards the posterior margin, with reddish nervures and branches; at the distal end of the cell is a yellow mark, divided broadly by the 2nd pseudoneurus; the disc with a broad whitish transverse band, divided by the nervules, each internervular division strongly arrow-like, the points towards the discoidal cell, and suffused with yellow, with the bases a pinkish white; fringe lunules, which are very delicate, white. Secondaries, above, a rich glowing warm or golden yellow, shading into a delicate lemon tint towards the posterior margin by any change of light or position; base black; posterior marginal band black, and gracefully and strongly lunated (or rather dentated); abdominal margin a warm velvety-black, including the abdominal fold, with tolerably long fringe-hairs. The veins delicate and black, with the subcostal nervure curved from the base; wing outline only moderately lunate.

Undersurface similar in all respects to the above, except that the obverse side of the abdominal fold is rather a lighter brown-black, with an anal streak of golden yellow atoms, and a few of the same on the black lunation next above it; the costal margin is narrowly black, and the yellow internervular space next to it is partly darker, from the upper surface black shewing through.

Head and thorax black; eyes castaneous; pronotal red collar prominent; abdomen reddish-black above with 2 yellow marks on the penultimate segment; subdorsal yellow growing gradually broader, till at the penultimate segment it is entirely of that colour; articulations intensely subdued by black atoms; anal valves pinkish-pearly white, and fairly pointed; legs almost hidden in the thoracic black, when at rest; thorax with no pectoral red spots.

Length of thorax with head, 20 mms.; of abdomen or antennæ, 26 mms.

Costa, 62 mms.; width of wing, 37 mms.; posterior margin, 43 mms.; inner margin, 31 mms.; width of posterior wings, 33 mms.; length, 40 mms.

Of Legs (including the trochanters) { 1st pair: femur, 9; tibia, 6; tarsi, 10 mms. / 2nd ,, : ,, 11; ,, 10; ,, 13 ,, / 3rd ,, : ,, 10; ,, 11; ,, 13 ,, }

♀. Primaries. Peppered creamy white,—the atoms are reddish and are scattered equally, except between the 3rd median nervure and the submedian nervule, where they are more dense or clouded midway from the base; the veins all ruddy brown-black and very prominent—the discocellular nervules broadest of all; from the costa to the 2nd submedian branch a ruddy brown—darkest towards the base; a broad submarginal red-brown band is nearly equally indented strongly in the direction of the cell, between the nervules, becoming much larger as they approach the apical angle; base of the wing dark red-brown. Undersurface the same as above, except that the large light area is a reddish creamy white, the pepperings very faint, and the dentations of the marginal band are at their apices slightly divided with white, and dusted half way on the darker portions with reddish white atoms, except towards the apex of the wing; fringe lunules prominent and white.

Secondaries. The area from the base to a little way beyond the cell in every direction a greenish lemon-yellow, slightly speckled with black atoms and hairs; the remainder of the wing is a deep brownish black, with a submarginal band of cuneiform lemon yellow marks, divided each by a dark nervure, and subdued by black atoms till at the abdominal margin they are rendered quite obscure; towards the cell the discal black is concavely lunate, and the effect of the submarginal yellow marks is to suggest a discal band composed of 7 black cones united with the black marginal dentations: the largest of the yellow divisions is between the 1st and 2nd subcostal nervures; posterior margin with creamy-white fringe lunules. Undersurface as above, except that the yellow submarginal band is brighter, with fewer black atoms, and is rather broader, the inner discal black forming a series of cones, with their points towards the cell, of which the 1st is continuous with the black of the costa and base; the veins stout, and distinct on the yellow parts.

Thorax black pilose; head black, with castaneous eyes; pronotal collar red; no pectoral red spots; abdomen brown above, pale greenish yellow below, with black lateral dots, and a double row of ventral black linear spots; the legs black, with femora nearly concealed by the pectoral black; anal tuft prominent, and slightly darker than the segment.

Costa, 80 mms.; width of wing, 47 mms.; posterior margin 54, and interior margin 45 mms. Secondaries: width 35, length 57, length of abdominal margin, 37 mms.

Length of thorax with head, 20 mms.; abdomen, 33 mms.; antennæ, 30 mms.

Legs: { 1st pair: femur, 10; tibia, 7; tarsi, 11 mms. / 2nd ,, : ,, 12; ,, 11; ,, 15 ,, / 3rd ,, : ,, 11; ,, 11; ,, 14 ,, }

Hab.: Kina Balu, Borneo.

In museum of Hon. W. Rothschild.

♀. In Mr. H. Grose-Smith's collection. The anterior wings do not differ, except that the peppering is deepest to a short distance from the base; and on the undersurface a little more clouded with the red-brown scales, especially at the base. The posterior yellow area and yellow submarginal marks relatively to the black, occupy a little less space on both surfaces, than in Mr. Rothschild's example.

Costa 71; posterior margin 52; interior margin 57 mms. Secondaries, width 33; length 55 mms.

I have to thank the above-named gentleman for the kind loan of the examples from which the plate and text were produced.

The ♀ of this species bears some resemblance to the ♀ ♀ of *P. Amphrysus* and *Rufficollis* on each surface of both wings; but the light area of the Primaries is more extensive than in those forms. The secondaries are however closely alike in all three forms; but while the abdomen is so dark in Andromache, it is very light in the others. On the contrary the ♂ bears no resemblance to the ♂ ♂ of the *Amphrysus* group, and is smaller in proportion to the size of its female than the latter are to their respective consorts.

POMPEOPTERA MAGELLANUS.

Ornithoptera Magellanus, Felder; "Wien. Ent. Mon." VI., p. 282, n. 31 (1862).
Papilio Magellanus; Felder, "Verh. z. b. Ges. Wien." p. 291, n. 27 (1864).
" " ♂ ♀, Felder, "Reise Nov. Lep." I., p. 14, n. 7, t. 5, f. a. (♂), b. (♀). (1865).
Ornithoptera Magellanus; Wallace, "Trans. Linn. Soc." Vol, XXV., p. 41 (1866)
Pap. Magellanus; W. F. Kirby, "Syn. Cat. Diurn. Lep." p. 519 (1871).
Orn. Magellanus; Oberthür, "Cat. Raisonne de Pap. de la Coll. de Ch. Oberthür," p. 32 (1879).
Ornithoptera Magellanus; W. F. Kirby, Cat. of Coll. Diurn. Lep., formed by the late W. C. Hewitson, p. 1 (1879).
" " Fickert, "Ueber die Zeichn. der Gattung Ornith.," in Zoolog. Jahr. b. (1889) p. 740, 743 ♂, 744 ♀.
" " "Semper, Phillip. Tagfalter," p. 264, n. 385 (1891).
" " Haase, "Untersuch. üb. Mim." p. 29 (1893).
" " W. F. Kirby, "Bird-Winged Butterflies of the East," in *Nature*, Vol. 51, p. 255 (1895).
Troides Magellanus; Walter Rothschild, "Novitates Zoologicæ," Pt. vii., Vol. II., p. 232, n. 26 (1895)
O. Magellanus; W. F. Kirby, "Handbook to the Order Lepidoptera," Vol. II., p. 265 (1896).
Ornithoptera Magellanus; Dr. Fr. Walker, "Oriental Entomology," Pt. II., p. 15. (No date published.)

This species is *sui generis*, the most remarkable of butterflies in its colour arrangement, whether in the male or female. The Xanthochroic species of Ornithoptera are represented in *Magellanus* by the hind wing having attained apparently the maximum area of undivided pure rich yellow,—that is to say, undivided except by the very black veins on the upper and under surfaces, so far as the ♂ is concerned, while the broad submarginal band, and the discocellular and discal area of yellow in the ♀ are equally conspicuous on the upper surface of the hind wings. Only this rich graduated golden yellow can be seen when the insect is viewed in a box, or even in a strong direct light; but if we place the insect nearly on the level of the eye and examine it opposite the light, the whole of the hind wings will be transfigured: the yellow will have given place to the most splendid iridiscence of blue and emerald green, with a faint golden sheen towards the hind margin—the blue ranging from silvery and azure to ultramarine, with just a suggestion of a rosy tint. If the insect be viewed on the same level against the light, the yellow gives place to a nearly uniform area of graduated emerald green. Some of the S. American Papilios—i.e., the red and black species, which I propose to call ORNITHOPTERINA furnish on a smaller scale a similar iridiscence over the crimson patches; and I remember the late W. C. Hewitson calling my attention once to a lovely Erycinid in his collection which he had just described under the name *Eurygona præclara*, in which the orange-red and black wings above appear shot with the most vivid amber and silver blue, when held with its head away from the light—this iridiscence being equally glorious in the black as on the orange surface of the wings—the glory surpassing even that of the Morphos [see his fig. in his "Ill. of New Exotic Butterflies," vol. iv, pl. ix of Eurygona, fig. 90.] All the latter, together with the blue Morphos, are found on the S. American continent, where splendid iridiscent butterflies of many genera are very much in evidence; while *P. Magellanus* inhabits the Philippines, a group of islands also famous for the diversity and splendour of its fauna.

So far as my knowledge of this species extends, after an examination of the examples in the Hewitson Collection, the British Museum, the Salvin and Godman collection, the Rothschild, and Mr. H. G. Smith's collections, the ♂ ♂ differ very little on either surface from the Felder type which I figure on Pl. 67 (figs. 1, 2, and 1a, 2a) of this work, and again on Pl. 68. The ♀ is subject to some slight variation however, and the iridiscence is found to vary also in intensity from that of the ♂, and also in different examples.

♂. Anterior wings deep velvety black, shot with a faint silvery sheen; the nervules stout and intensely black, passing through the discal rays of pale yellow, with faint edgings of pale yellow within the discoidal cell along part of the median nervure, and the discocellular nervure; these rays are slightly modified by black atoms; the fringe lunules are thin and white. The posterior wings are rich golden yellow graduated to a slightly redder yellow towards the base; the veins are stout and very black; the area of the yellow, when viewed obliquely opposite the light is a splendid iridiscence of silvery to ultramarine blue, and emerald or golden green; against the light entirely an apple green, emerald, or golden green. The submarginal border velvety black, and indented or lunated inwardly; no fringe lunules; the base within the precostal nervure, dark brown; a number of faint, dark hairs spring from the basal portion of the median nervure on the side nearest the abdominal margin; from the submedian nervure the whole of the abdominal margin is black, with a sufficient indication of the outline of the fold or pouch, which conceals the *androconia*. The undersurface of the anterior wings similar to the upper, except that the black is less intense and warmer, and the yellow rays are rather broader and more distinct. The posterior wings are nearly identical in colour and in all other respects with the upper surface; but the abdominal margin is silvery reddish brown, with the fairly long abdominal fringe still lighter reddish. The scheme of iridiscence is the same as above. The upper wings of this sex have the costa long and not quite so arcuate as in the ♀; the posterior margin is also long (within 4-5ths of the length of the costa) and prominently concave onward a short distance from the apex, the outline also being delicately lunate; the under wings are sufficiently lunate.

Head and thorax, velvety black; eyes, dark brown; pronotal collar, crimson scarlet; abdomen, yellow, shot with the same iridiscence as that of the wings, with a faint orange-red dorsal longitudinal ray from the base, and black lateral patches accentuating the segments; the anal valves pearly white, with a triangulate dorsal black mark. The subdorsum yellow with lateral black dots. The pectoral surfaces of the thorax dark brown, with scarlet crimson lateral spots; legs black.

Length of costa, 79 mms.; of posterior margin, 66 mms.; of interior margin, 39 mms.; width of wing, 45 mms.; length of costa of hind wing (i.e., from the base to the apex), 34 mms.; of posterior margin, 35 mms.; of abdominal margin, 38 mms., greatest width of wing, 35 mms., and length, 44 mms.

Length of thorax and head, 11 mms.; of abdomen or antennæ, 31 mms.

Length of legs:	1st pair:	femur	11;	tibia	8;	tarsi,	12	mms.
	2nd ,,	,,	11;	,,	12;	,,	15	,,
	3rd ,,	,,	11;	,,	13;	,,	15	,,

Habitat: Babuyanes; Polillo; E. Mindanao, Philippine Islands.

♀. Anterior wings dark fuscous brown; with a bluish silky sheen playing over the brown, most intense at the base within the cell; all the nervures and nervules very dark, stout, and proceeding each midway through more or less broad opal-white rays and bands—the discal rays being somewhat fuscous in tint towards the posterior margin, and the discocellular bands from the base; the pseudoneura are strongly marked; there is also a very narrow short whitish ray near the outer margin divided by the submedian fold; the fringe lunules are fairly prominent, and of the same colour as the rays.

Posterior wings a rich gamboge yellow; with a broad discal band of black strongly lunated within (or towards the cell) and still more strongly lunated or scalloped without (or towards the hind margin); the submarginal black band is broad and strongly indented; the two bands therefore absolutely enclose the discal areas of yellow, causing them to form a series of 7 irregular lunate or dentate marks, divided by the nervules—the 1st apical, quadrate, the 2nd subquadrate and lunate, the 3rd broad and bidentate; the next three more narrow and bidentate, and dusted with black atoms, their bases being whitish; and the 7th at the anal angle almost like a broad note of interrogation; the abdominal margin is brown; all the yellow and brown almost from the median nervure being shot with an opalescent white; the veins very black, and very prominent also on the black or dark bands; the base of the wings with the precostal nervure brown; a few white atoms on the submarginal band near the yellow; the fringe lunules are white; as in the ♂ the yellow of the wings, when viewed obliquely or on a level with the eye, at a point opposite the light, becomes a glorious opalescence of blue, green, and pink. The anterior wings as in the ♂ are somewhat concave at the posterior margin; and the posterior wings have the outer margin lunate.

The underside of the anterior wings with markings similar to those above, except that the white area of the discoidal cell is rather more extensive, and together with the two lowest white rays of the disk is sparsely dusted with black atoms from the base. The posterior wings with their markings similar to those of the upper surface, except that the 7 submarginal dentate or subdentate marks are fuscous white instead of yellow. The yellow of the hind wing is also opalescent in the position mentioned above, but in a fainter degree.

The thorax and head a warm brown; eyes silky brown; antennæ black; pronotal collar crimson scarlet; abdomen ochraceous or opal-whitish, and tuft reddish-brown; subdorsum yellow, with black marks in each segment; lateral black dots. Thorax beneath with broad crimson pectoral marks between the legs, and on the pronotum; legs black; haustellum black.

Length of costa, 82 mms.; of posterior margin, 61 mms.; of inner margin, 43 mms.; width of wing above, 49 mms. Length of costa of posterior wing about 45 mms.; of posterior margin, 39 mms.; of abdominal or inner margin, 43 mms.; width of wing, 35, and length, 53 mms.

Length of legs	1st pair:	femur,	9;	tibia,	8;	tarsus,	11	mms.
	2nd ,, :	,,	11;	,,	13;	,,	15	,,
	3rd ,, :	,,	10;	,,	12;	,,	15	,,

The figures on Plate 67 are all drawn from Felder's types, for the loan of which I am greatly indebted to the Hon. Walter Rothschild.

A ♂ example in the British Museum is more brilliantly opalescent on both surfaces than in Felder's type, so also is one in Mr. Henry Grose-Smith's collection. A ♂ in the Hewitson collection is larger than Felder's type, and the red pronotal collar is almost concealed by the black, while in all the British Museum specimens (which include also the great Godman and Salvin collection) the yellow of the posterior wings beneath are shot with a rich emerald green when viewed obliquely *against* the light.

Hab. ♀ Luzon; Mindanao, Philippine Islands.

The figs. on Plate 69 are from specimens in the collection of Mr. Henry Grose-Smith; and I here thank him for the kind loan of them.

The ♂ of this species is sufficiently distinct from, and the ♀ abundantly unlike that of any other species.

POMPEOPTERA HEPHÆSTUS.

Papilio Hephæstus, *Felder*, "Verh. z. b. Ges. Wien," V. 291, p. 291, n. 29. (1864). ♂ ♀.
,, ,, ,, "Reise Novara," Lep. I., p. 16, n. 8. (1865) ♂ ♀.
,, **Pompeus,** *v. Hephæstus*, Hopffer, "Stett. E. Zeit." p. 18, n. 2. (1874) ♂ ♀.
,, ,, ,, Snellin, "Tijdschr," v. Ent. xxi. p. 37, n. 146. (1878). ♂ ♀.
Ornithoptera Hephæstus, Oberth., "Ét. d'Ent." IV. p. 31, n. 12. (1879) ♂ ♀.
,, **Pompeus,** *v. Hephæstus*, Fickert, "Zool. Jahrbüchern," p. 729. (1889).
,, **Hephæstus,** Holland, "Proc. Boston Soc. N.H." XXIV. p. 77, n. 124. (1890). ♂ ♀.
,, ,, Rothschild, "Iris V. p. 442. (1892). ♂ ♀.
Troides Helena Hephæstus, Rothschild, "Novitates Zoologicæ," Vol. II., p. 222. (1895).

♂. Anterior wings entirely velvety black, and immaculate—the veins only slightly visible. Undersurface as above; but a little lighter and glossy towards the outer margin.

Posterior wings rich golden yellow; the base and a very small basal portion of the cell black; the costa and part of the subcostal area obliquely black; the wings richly black; half the submedian area and the abdominal margin also black; and an outer marginal lunate band of black. Undersurface exactly as above, except that there is a small black orbicle above the lunation within the 3rd and 4th median nervules, and the submedian area of black has a ruddy gloss. The abdominal fringe is delicate and black.

Thorax and head black; eyes nitid black; abdomen dorsally black, with a central stripe of fawn colour, and laterally and subdorsally yellow, with the usual lateral black dots very small. Anal segment buff white.

Length of costa of anterior wing 77, of outer margin 58, and interior margin (which is nearly straight) 38 mms. Greatest length of the posterior wing 43, and width 31 mms. Length of abdomen or antennæ 30, and of thorax with the head 19 mms.

The male greatly resembles the ♂ of Cerberus in its superficial appearance, but the anterior wings are slightly wider in proportion to the posterior, and there are no adnervular light rays visible.

Habitat: Celebes. I am indebted to the Rev. Alfred Fuller for the pleasure of drawing my figures from his lovely specimens.

♀. Anterior wings black, with buff-coloured adnervular rays, subdued somewhat by scaling, whereof the 1st, 2nd and 3rd median are perfect, but much subdued as they reach the outer margin, those above are only rudimentary, or nearly obsolete, except close to the cell, and between the 1st and 2nd subcostal nervules; the cell is margined also at its upper part, half way from the distal end, with a buff-white streak, and a very narrow distal continuation curves round to the median vein; there is a very faint trace of a ray at the 3rd median branch, and a conspicuous ray spot, strangely divided by the submedian vein near the posterior angle. Undersurface as above, except that all the rays are a purer buff-white, more complete and pronounced, and the cell streak extends at its upper part from the distal end nearly to the base.

Posterior wings: the description of the cotype from the Felder collection, printed on the next column, serves for the description of the example now under consideration, except that part of the submedian, and the inner submarginal areas are black. Undersurface almost entirely as above. [See plate 36.]

Thorax and body nearly as in the Felder cotype.

[The ♀ type form has the light rays of the anterior wings more perfect and prominent, as in the cotype on plate 36 of this work.]

Length of costa 81, of outer margin 62, and of interior margin 43 mms. [The interior margin is nearly straight.] Length of posterior wing 48, and width 36 mms.

The posterior wings strongly resemble those of Felder's *Plato* [plate 39, figs. 5, 6].

Hab.: N. Celebes. From the collection of the Rev. Alfred Fuller.

♀. Anterior wings warm brownish black—lighter towards the outer margin; the adnervular rays white, and scaled towards the outer margin: these rays, or areas of white, extend from the subcostal vein to the 3rd median nervule; to the 2nd submedian the rays are united at near the discoidal cell, and the white area is continued to 1-3rd of the cell at the distal end as a series of 3 elongate marks; the 3rd median ray is short, commencing a little less than half-way from the cell; a short submedian above, and a longer white stripe below the submedian vein completes the light marks of the anterior wing above, these are slightly bluish green. Under surface of wings as above, except that all the white areas are purer, less scaled, and more definite in outline. Posterior wings golden yellow; the basal half of the cell, and all but a narrow yellow subcostal mark black; the abdominal and submedian area warm brown, with a yellowish white lunation at the inner angle, extending to the base as a couple of light streaks, and enclosing an elongate black spot; there is a transverse discal row of 6 black subhastate black spots, the upper one being the largest; and a submarginal lunate black band; the fringe lunules of all the wings are short, thin, and white. Under surface as above, except that the black marks are slightly outlined with white scales, there is no black mark at the abdominal angle, and the submedian area is, with the exception of the abdominal angle, entirely warm brown.

Thorax brown-black; eyes castaneous brown; abdomen warm brown; laterally and subdorsally yellow white, with lateral black dots, and subdorsum slightly black; pronotal collar red, and the usual thoracic red marks above the legs.

Length of costa of anterior wing 77 and width of wing 42 mms.; length of posterior wing 49 and width 35 mms.

Habitat Celebes. Lorquin. From Felder's subtype, in the Tring Museum.

This is a variation from the Felder type.

THE LARVÆ AND PUPÆ OF THE TROIDES OR ORNITHOPTERA.

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LARVA, PART I.

The Caterpillars of the Ornithoptera are, like those of the Papilios, composed of 13 fleshy segments or parts; the anterior segment represents the head of the imago, as it does of the larva; the 2nd, 3rd and 4th each bear a pair of pectoral or true legs: these segments and legs constitute in the imago the thorax and thoracic legs; the 5th and 6th segments are plain extensions of the body, each with two minute fleshy spines on the subdorsum; the 7th to the 10th are each furnished with a pair of prolegs of an apparently simple, but really more elaborate structure; the next two segments are quite simple in character, and the last, or 13th constitutes a pair of anal legs similar in character to the other prolegs, thus the latter 7 segments go to form the abdomen or body of the perfect insect.

The 1st segment or head is armed with a pair of strong mandibles and a moderate sized upper lip—emarginate on the front edge; the maxillæ and labium are small, fleshy, and soldered together, and the eyes and general parts of the head are black and horny; the clypeus is triangulate or nearly so; the eyes, which form the greater part of the head appear to be rather rugose, with exceedingly minute hairs springing from every portion of their area, and they are not facetted as in the perfect insect. Between the head and neck is a furcula or pair of nuchal tentacles supposed to be enclosed in a coral red sheath which can be excerted or withdrawn at pleasure. These are very long and prominent in the Ornithoptera, and are probably intended to keep off ichneumons or other foes. They may also give out a distinct odour at such times, but this is merely conjecture: the vivid colouring may also serve a warning or threatning purpose. The whole body of the caterpillar is furnished with a number of fleshy moveable spines, more or less long, and systematically arranged, varying in number and in length on each segment; they are situated in linear order, longitudinally: the second anterior segment has four, the 3rd, 4th and 5th eight, the 6th six, the 7th to the 12th four each, and the anal segment two apparently. The base and apex of these are generally black, and the centre coral-red: there are also two subdorsal rudimentary spines on the 5th and 6th segments; all these are verticillate, and variable in length. All the segments except the 1st, 3rd, 4th and anal are provided with a small oval stigma on each side in which is an opening into the body, with a chitonous margin; these are the breathing organs, and they make their appearance again in the chrysalis.

The three pairs of perfect legs consist of three cylindrical joints, covered with a chitonous skin and terminated with a claw, which, relatively to the stout size of the joints, is very small, though probably very powerful. [In the perfect insect the ungues or claws are bifid, longer in proportion, and very powerful in their ability of clinging to any object. In some lepidoptera their tenacity is really extraordinary, as is the case with many coleoptera and insects of other orders]. The base to which the joints are attached is a thick tumid protuberance from the segment, and appears to consist of two parts or divisions —the lowest quite rounded, the upper sub-cylindrical; the exterior portion or front (i.e. towards the head) is chitonous, like the joints of the legs, the hinder part fleshy, like the body of the caterpillar; the upper division is also fleshy and bears a verticillate and (moveable?) spine, like the general spines of the body, which is also black and coral-red. Each of the leg joints are armed with a multitude of minute setæ or bristles—the tumid protuberance is furnished with these setæ. The four pairs of prolegs, which with the rest of the larva correspond to the abdomen of the imago are apparently more simple, but in reality are more elaborate in structure and evidently very muscular—indeed the muscular power of the whole creature is very great. As in the case of the six anterior legs, these prolegs are somewhat opposable in each pair. First there is a very tumid extension of each segment of

* The Authors quote Swammerdam (Hills', "Swammerdam," Vol. II. p. 37, f. 2, 4), as having discovered by dissection that not only the skins of the larva and of the pupa are encased in each other, but within them the butterfly itself, with its organs indeed in an almost fluid state, but still perfect in all its parts; and they describe the *modus operandi* by which anyone can prove this for himself. (P. 36, 7.)

the body to which is attached a short fleshy spine; a delicate sinus is followed by the second portion of this protuberance, this again by a nitid chitonous part, somewhat rugose at the sides, probably of a muscular character and concluding with a soft light sienna organ, or pad, with 3 indentations (resembling very much a microscopic potato) which *may* serve the purpose of exhausting the air; round the inner portion of this pad is a crescent of many very minute recurved hooks. These complex arrangements are intended to enable the creature to retain a strong hold of the object on which it is resting, while it can move the anterior part of its body in any direction with perfect security. They are probably retractile, and, being opposable as the human thumb and fingers are, serve as very efficient claspers. The prolegs attached to the anal or 13th segment are identical in structure and purpose with the 4 intermediate ones, and they are all furnished with a large number of minute setæ. The general colour of the larva is rufous brown, with two lateral irregular-shaped bands of light sienna colour, and one suboval spot below each band, situated on the 7th segment. In some species there is a second pair higher up on the 8th segment; the dorsum is generally striped longtitudinally, with a pair of triangulate stripes on each segment, and O-like dark lateral marks. Some of the species are without these marks, and the light lateral patches are different in shape and length. Though there are some papilios whose larva resemble those of the Ornithoptera, there would be no difficulty in distinguishing between them.

These larvæ belong to the CHILOGNATHIFORM or SCOLOPENDRIFORM stirps of the Lepidoptera in the system of Macleay, adopted by Dr. Horsfield:* the SUCCINCTI, or 1st tribe of Section 1 in Boisduval's arrangement: the first family of Westwood's group of Heterocera, the NUDI: the second family of Swainson's quinarian scheme; the first primary group of Latreille (in his *Révue Animale*) and the 3rd secondary section, the HEXAPODA: the first or EQUITES group of Linnæus and the 1st division or TROJANS: and the first family of Trimen's arrangement. But all modern plans of classification assign their position to the latest but one of the Diurnea in the 2nd sub-family of the Papilionidæ, or midway between the *Pierinæ* and *Hesperiidæ*, all of which are perfect Hexapods.

Doubleday sought the divisional element between *Ornithoptera* and *Papilio* in the larvæ, which he said "had an external forked sheath for the prothoracic tentacula, thus differing from *Papilio*, but Wallace ("Trans. Linn. Soc.," vol. XXV., page 35) declared that *O. Poseidon* larva has no such arrangement as this. Philip Henry Gosse found a similar structure in some species of *Papilio*, thereby indicating that the arrangement may obtain in both divisions of the Papilionidæ.

Reasoning on Dr. Horsfield's observations in Java on the larvæ of the Papilonidæ, of which a considerable number were known to Wallace, he came to the conclusion that these furnished good characters for the primary division of the Genus Papilio (in which at the time he included the Ornithoptera) into natural groups. The manner in which the hinder wings are plaited or folded back at the abdominal margin, the size of the anal valves, the structure of the antennæ, and the form of the wings are of much service, as well as the character of the flight, and the style of colouration. Using these characters he divided the Malayan Papilios into 4 sections and 17 groups. At the head of them he placed the Ornithoptera—making them a Genus containing 3 subsections as follows:—*a*. PRIAMUS Group: black and green; *b*. POMPEUS Group: black and yellow; *c*. BROOKEANUS Groups: black, blue and green.

The SCHOENBERGIA and ÆTHEOPTERA groups had not, when he wrote, been discovered, or his conclusions might have been considerably modified.

PART II. i. Larva described.

O. Pronomus. Feeds on a species of Ipomæa, which twists itself among and over the brushwood, often to a considerable height, or trails itself along the ground. The larva feeds on this plant and on any part of it. "Length 2½ inches; tapers slightly towards each extremity; central segment thickened; comparatively short and obese; smoky black with a tinge of madder purple; head black and shiny, with a narrow white V-shaped mark on the face; in the crown of the 2nd segment a crescent shaped shining black plate, and between this and the head is the nuchal aperture, through which, when the larva is irritated, is emitted a pair of short carmine-coloured tentacles; a subdorsal row of finely-pointed spines in each side, the spines rather long, and those on the posterior segments pointing backwards; tips and base of the spines black, intermediate portion scarlet, except in the 8th segment where the base of the spine is white, and from thence springs a broad oblique white stripe, pointing forwards, and terminating at the spiracular region; a row of black spines just below the spiracles; upon the 3rd, 4th, and 5th segments an additional spine between the subdorsal and spiracular row; a short black blunt tubercle on the 2nd segment upon each side of the face; a short black spine above each leg and claspers, which are shining black."—Gervase F. Matthew, R.N., in the "Entomologist," vol. 19, page 84.

Mr. Matthew informs us also that these larvæ do not differ from those taken in the Duke of York Island and New Britain, and will produce *Urvilliana* or the usual golden green forms of the perfect insect.

O. Poseiden. Pl. 34, fig. 4, with 2 lateral light stripes on the 8th segment. Colour rich dark rufous brown. Habitat, Little Kei Island. In the same collection.

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* Mr. Macleay was careful to guard the student of his system from misapprehension; for he remarks in his "*Horæ Entomologicæ*," p. 423, that "in terming larvæ *Chilognathiform* and *Chilopodiform* it is not meant that they are *Scolopendræ* or *Juli*, or even near to them in affinity, but only that they are so constructed that certain analogical circumstances attending them strongly remind us of these *Ametobola*." Of course the Centipedes, Wireworms, or Woodlice are structurally very different from the larvæ of either Coleoptera or Lepidoptera; and unlike the latter are not subject to a progressive metamorphosis; hence their lower position in the scale of life. Macleay adopted Dr. Leach's *Class* Ametabola, which, at the time was only allowed to consist of two divisions—the *Thysanura* and the *Anoplura*. To these he added two divisions of the Myriapoda and also Vermes. In his examination of the Coleoptera he divides them into the following 5 groups:—

(*a*) Carabus and Dytiscus, represented analogically by the Chilopodiform Ametabola;
(*b*) Scarabæus, by the Chilognathiform Ametabola;
(*c*) Curculio and Cerambyx, by the Vermes;
(*d*) Coccinella and Chrysomela, &c., by the Anopluriform Ametabola;
(*e*) Meloe, &c., by the Thysanuriform Ametabola.

Dr. Horsefield made the Butterflies to consist of 5 stirpes, or divisions, which he arranged in accordance with Macleay's principles, from the analogies they exhibit to the orders of *Ametabola*:

(*a*) Lycænidæ, by the Vermes;
(*b*) Colias, Papilio and Doritis by the Chilognathiform Ametabola;
(*c*) Euplœa, Vanessa, Argynnis, &c., by the Chilopodiform Ametabola;
(*d*) Apatura, Morpho, Hipparchia by the Thysanuriform Ametabola; and
(*e*) Erycina, Hesperia, &c., by the Anopluriform Ametabola.

The Ornithopterus larvæ come into the 2nd division.

O. Urvilliana, " 4 inches long; thick as the little finger (a vague term); rich brown; spines tipped with lake; a saddle-like cream coloured patch across the middle; above the head a bifurcated, retractile, urticating process, pink in colour, is protruded when the insect is alarmed." The writer of this paragraph (whose name I unfortunately omitted to notice when I copied it) affirms that the larva of *Æth. Victoria* does not differ from the above description, except in the absence of the saddle-like mark across the middle.

Feeds on Aristolochiæ, is yellowish, with a broad dorsal stripe, dilated to a band in the 6th segment, and 8 rows of fleshy spines (W. F. Kirby, " Handbook to the order Lepidoptera," Vol. II., p. 255).

P. Helena " Larva elongated, thick, slightly attenuated at both ends, with dorsal and lateral row of rather long fleshy tubercles; the 2nd segment furnished with a horny plate, beneath which the nuchal retractile tentacles lie concealed."

P. Pompeus, Horsfield," Cat. of Lep. Ins. in the E. Ind. Mus." Vol. I., pl. ii., figs. 1, 1a gives coloured representations of the larva and pupa of this species. My plate 34, fig. 1, portrays the larva of this species also, from a blown-out specimen. It has 2 light patches on each side of the 7th and 9th segments, that on the 8th being situated higher up and rather narrower; they are burnt sienna colour. Habitat Java, the examples are in the Tring Museum.

O. Pegasus, Pl. 34, figs. 2, 3. Lateral and dorsal views. 2 lateral light stripes on each of the 7th and 8th segments, reaching to a little above the dorsal spines. Larva dark rufous brown; nuchal tentacle coral red. Hab. Little Kei Island. In the Tring Museum.

P. Papuensis, Pl. 34, figs. 5, 6. Lateral and dorsal view with 2 lateral light stripes on each of the 7th and 8th segments—those on the 7th being divided at the lower portion near the prolegs into a second subcircular light spot; colour dark brown, and velvety. Habitat, German New Guinea. In the Tring Museum.

The general view of the larvæ *ante*, will suffice without any further description, as the species differ very little from each other in form and structure. I have in my plate drawn the larva slavishly from the blown-out specimens, as I thought it best under the circumstances. I regret that the lithographic stone on which the plate was drawn had been very coarsely and badly grained, or the result of my work would have been much better.

ii. PUPÆ described.

So far as I am aware the Pupa of O. Priamus has not been described; but it probably does not differ much from those of other species.

O. Urvilliana. " Suspended head downwards beneath a growing leaf, with a silken band round the middle of the body. The leaf protects the larva from sun and rain; but lest the leaf should be accidently blown away the larva, before entering upon the pupa stage, spins a short silken web along the lower side of the leaf stalk, and securely fastens it to the stem from which it grows." The perfect insect emerges in from 14 to 21 days. " It is necessary to suspend the pupa in a vertical position, otherwise the meconium or liquid in the pupa-case, of which there is nearly a teaspoonful, would entirely ruin the plumage." *Guillemand*, " *Voyage of the Marchesa*," *Vol. II., p. 345.*

As a matter of experience I have no doubt that the discoloured specimens we meet with, especially of the Pompeoptera, are the results of this fluid not finding its proper exit, and so staining the wings, as the imago emerges. It is significant that the posterior wings, which are higher up in the pupa case, are generally stained the most. A general supposition is that the stains are caused by damp. I hardly think so.

O. Prononus. Chrysalis amber brown, slightly angulated, with a blunt sub-dorsal black-tipped spine on each side of the abdominal segments, and some small black spines on the back of the thorax; a large and almost triangular orange-yellow blotch upon the back of the anteror abdominal segments, the wing sheaths dark reddish-brown, with the nervures well marked." *Gervase F. Matthew*. The pupa of some of the species are attached to the midrib of a large leaf of a forest tree, and sometimes at a considerable distance from the food of the larva. Before suspending itself, the caterpillar takes care to securely fasten the stem of the leaf at its base to the branch of the tree with strong threads of silk. The silk is extruded from the spinnerets near the mouth of the larva.

On plate 34 I give figures (some of them drawn from broken or distorted specimens of the following Pupæ :— (*a*) *Poseidon*, figs. 7. 13, prevailing colours light amber and brown ochre; the veins within the wing-sheaths very prominent; the middle segments with a central series of dark lines which also extend nearly to the 11th segment; also a series of 2 black lines on each side near to the spiracles; the spiracles easily seen along their tract; and the insect within probably obtains air, as a necessity even to its pupa stage. (*b*) *Pompeus*, fig 8. Smaller than the preceding; extremely angulate, amber and light ochre coloured; with 6 large and long intermediate segment spiny processes; the veins in their wing sheaths not very prominent. (*c*) *Amphrysus*, figs. 9, 10. Smaller than the preceding, but closely resembles it; colour very pale. (*d*) *Poseidon*, v. pronomus figs. 11, 12, amber and brown ochre colours; the abdominal spines short. (*e*) *Poseidon* v. aruana, Pupa large; colours ochraceous and dark sienna brown; the veins showing strongly on the wing sheaths; the spiracles and all the markings very prominent. This example and that of figs. 9 and 10 are both in the Hope museum at Oxford; all the rest are in the Tring museum. *(f) Sch. Paradisea*, fig. 14 colours ochraceous, burnt sienna, dark rufous brown, and black; all the markings and parts very conspicuous; but no essential difference from the other species in structure or appearence.

For the guidance of students new to the investigation of these Pupæ the following particulars may be added: —the small, narrow longitudinal compartments, arranged like mummy bands, extending from the anterior extremity of the body to over the breast, are the coverings of the legs, spiral tongue and antennæ; the head covering is a piece called the *cephalotheca*; the wing sheaths situated outside these bands are two broad plates or scales, the *pterotheca;* the covering of the thorax, the *cytotheca*; the abdomen case is the *gastrotheca*. The number of segments of the chrysalis is the same as in the larva, and so are the spiracles or breathing organs. The different parts of the perfect insect can generally be recognised in the pupal stage.

SYNOPSIS OF THE PRINCIPAL CHARACTERS OF THE GENERA TROGONOPTERA AND POMPEOPTERA.

A.—ANTERIOR WINGS.

1. Length of Costa a little less than 2 times and 1-4th of the interior margin. T. Trojana ♂.

1*a*. Length of costa a little more than 2 times that of interior margin. T. Brookeana, P. Magellanus, P. Dohertyi, P. Critonoides, Hippolytus, Naias, Plateni, Iris, (*males*); T. Brookeana, P. Cerberus, Darsius, Haliphron (*females*).

1*b*. Length of costa 2 times that of interior margin. P. Minos, Papuensis (*males*); Hippolytus, Naias (*females*).

1*c*. Length of costa nearly 2 times that of interior margin. P. Cellularis, Sulaensis, Neomiranda (*males*); T. Trojana, P. Miranda, Helena, Vandepolli, Minos (*females*).

1*d*. Length of costa 1 times and less than 40 mms. that of the interior margin. P. Helena, Vandepolli (*males*); Cellularis, Critonoides, Papuensis, Ruficollis, Pompeus, Riedeli, Æacus, Magellanus, Melpomona, Plato, Rhadamantus (*females*).

1*e*. Length of costa a little over 1 and 2-5ths that of the anterior margin, P. Andromache, Nereis (*females*).

1*f*. Length of costa a little over 1 and 3-4ths that of the interior margin, P. Melpomona ♂; Sumatranus ♂ ♀; P. Hycetus, Iris, Dohertyi, Plato (*female var.*)

1*g*. Length of costa about 1 and 3-4ths that of interior margin, P. Flavicollis, Nereis, Cerberus, Miranda (*males*); Amphrysus, Cuneifera, Hephæstus, Criton, Staudingeri (*females*).

1*h*. Length of costa a little over 1 and 2-3rds that of interior margin, P. Pompeus, Cuneifera, Plato, Andromache (*males*).

1*i*. Length of costa 1 and 2-3rds that of interior margin, P. Rhadamantus, Ruficollis (*males.*)

1*j*. Length of costa a little less than that of interior margin, P. Criton, Amphrysus, Staudingeri (*males.*)

2. Outer margin of anterior wings only slightly arched, P. Honrathiana, Criton, Papuensis, Melpomona, Ruficollis, Flavicollis, Amphrysus, Sumatranus, Cuneifera, Nereis, Pompeus, Cerberus, Miranda, Andromache, Magellanus, Rhadamantus, Darsius, Honrathiana (*males*); Vandepolli, Oberthuri (*females*); T. Brookeana, Trojana, P. Hippolytus, Cellularis, Sulaensis, Plato, Naias, Plateni, Dohertyi, Iris, Æacus, Minos (*both sexes.*)

2*a*. Outer margin more arched, Vandepolli, Neomiranda, Carolus (*males*); Honrathiana, Criton, Felderi, Melpomona, Papuensis, Flavicollis, Amphrysus, Sumatranus, Cuneifera, Nereis, Hycetus, Pompeus, Cerberus, Miranda, Andromache, Magellanus, Hephæstus, Fasciculatus, Rhadamantus, Darsius (*females*); Critonoides, Staudingeri, Riedeli, Helena (*both sexes*).

3. Anterior wings long in proportion to the posterior wings, T. Brookeana, Trojana (*both sexes*).

3*a*. Anterior wings proportionate in length to the posterior wings, all the Pompeoptera.

3*b*. Anterior wings rather pointed at the apical angle, T. Brookeana, v. *Eleanor*, P. Vandepolli, Honrathiana, Melpomona, Rhadamantus, Dohertyi (*males and some examples of the females*); P. Criton, Nereis, Fasciculatus (*females*); T. Trojana, P. Hippolytus (and varieties), Critonoides, Plateni, Miranda (*both sexes*).

3*c*. All other species ♂ or ♀ *not* pointed at the apical angle.

4. Anterior wings rounded at the apical angle, P. Cuneifera, Honrathiana, Rhadamantus, Darsius (*all females*).

5. Outer margin of anterior wings somewhat concave, P. Vandepolli, Criton, Critonoides, Amphrysus (*and vars.*), Cerberus, Iris, Andromache Æacus, Rhadamantus (*males*); Hephæstus, Helena (*females*); P. Hippolytus (*and varieties*), Cuneifera, Magellanus (*both sexes*).

5*a*. Outer margin rather convex, P. Vandepolli, Naias, Plateni, Dohertyi, Andromache, Æacus, Fasciculatus (*females*), Honrathiana (*both sexes*).

5*b*. Outer margin straight, or nearly straight, all species and sexes not included in 5*a* (*ante*).

6. Interior margin of anterior wings straight, or nearly so, P. Criton, Pompeus, Cerberus, Plateni, Staudingeri, Neomiranda, Andromache, Sumatrana, Riedeli (*males*); T. Trojana, P. Hycetus, Fasciculatus (*females*); T. Brookeana, P. Hippolytus (vars), Critonoides, Naias, Cuneifer, Miranda, Rhadamantus, Helena (*both sexes*).

6*a*. All other species or sexes with the interior margin more or less curved.

7. The 3rd subcostal nervule emitted close to the apex of the discoidal cell of the anterior wing. P. Vandepolli, Honrathiana, Naias, Amphrysus, Nereis, Cerberus, Andromache, Sumatrana, Rhadamantus (*males*); Critonoides var., Plateni, Staudingeri, Æacus (*females*); T. Brookeana, P. Hippolytus, and vars., Dohertyi, Iris, Fasciculatus, Darsius, Riedeli (*both sexes*); Helena, var. *Grose-Smithi*, ♂.

7*a*. The third subcostal nervule emitted a little below the apex of the discoidal cell of anterior wing. Andromache, Cuneifera (*females*); Hippolytus v. *cellularis* (*male*).

7*b*. The 3rd subcostal nervule emitted a little above the apex of the cell. P. Critonoides, Staudingeri, Neomiranda (*males*); Hippolytus v. *cellularis*, Vandepolli, Criton v. *Felderi*, Iris, Melpemona, Hycetus, Andromache, Hephæstus, (*females*); Plato, Criton, Naias, Papuensis, Amphrysus and its varieties, Nereis, Pompeus, Rhadamantus, Æacus, Helena, Minos, Haliphron (*both sexes*).

8. Anterior wings of the ♂ ♂ with no sexual stigma, the genera Trogonoptera and Pompeoptera.

9. Discoidal cell rather long and narrow, the ♂ and ♀ of T. Brookeana, Trojana, P. Naias, Iris; the ♂ of Neomiranda, Miranda, Æacus, and Rhadamantus; and ♀ of Andromache, Sumatranus, Magellanus and Hephæstus.

9*a*. Discoidal cell broad, the ♂ and ♀ of P. Darsius, Helena (type form), Hippolytus and vars.

9*b*. The cell half the length of the wing, the ♂ of P. Hippolytus and vars., Plato var., Criton, Ruficollis, and Flavicollis, Amphrysus, Nereis, Riedeli; the ♂ and ♀ of Papuensis, Pompeus, Plateni, Dohertyi, Cerberus, Minos and Darsius; and the ♀ of Cuneifera, Hycetus, Rhadamantus, Andromache, Hephæstus, and Helena.

10. Pseudoneura, 4 in number, and only slightly visible. T. Brookeana ♂ ♀, Trojana ♂; The ♂ of Brookeana and vars., P. Vandepolli, Honrathiana, Criton, Critonoides, Papuensis, Melpomona, Amphrysus and vars., Nereis, Pompeus, Cerberus, Plateni, Dohertyi, Iris, Staudingeri, Miranda, Neomiranda, Andromache, Magellanus, Æacus, Rhadamantus, Darsius, Minos, Helena and vars., Riedeli, Plato, Fasciculatus, Naias, and Haliphron.

10*a*. Pseudoneura sufficiently visible, the ♀ of T. Trojana, P. Plato, Critonoides, Cuneifera, Plateni, Iris, Dohertyi, Fasciculatus, Staudingeri, Miranda, Andromache, Amphrysus, Helena, Darsius, and Minos.

10*b*. Pseudoneura strongly emphasised, the ♀ of Magellanus, Hycetus, Pompeus, Nereis, Flavicollis, Papuensis, Melpomona, Naias, Criton, Honrathiana, Vandepolli, Hippolytus and vars., Æacus, Rhadamantus, and Haliphron.

10*c*. Pseudoneura 4 in number, the 1st and 2nd starting at the base of the cell, the 3rd at the base, and the 4th as a branch at half way from the base. All the species of both genera; but in the males of some species the 1st pseudoneurus is nearly or quite obsolete; the distance between each is generally equal, but unequal in a few, and in some the two branches 3, 4 are very close together.

B.—POSTERIOR WINGS.

1. The Costa arcuate, and the ♀ incurved near the apical angle, P. Hippolytus, and Criton.

1*a*. More or less strongly arcuate, but not incurved near the apical angle, all the other species of the two genera, and in both sexes.

2. With obscure dark abdominal fringe, or no fringes, *females* of Vandepolli, Ruficollis, Æacus, Rhadamantus, Nereis, Pompeus, Hycetus, Magellanus, Riedeli, Darsius, Minos, and Helena; almost entirely absent of the other females.

2*a*. With sienna red abdominal fringe, Amphrysus and varieties, and Andromache.

2*b*. With rather prominent dark abdominal fringe, all the other species of both sexes.

2*c*. The fringe is generally shorter than in the genus ornithoptera.

3. Discoidal cell elongate and rather narrow, T. Brookeana and Trojana; P. Plato, Nereis, Riedeli, and Helena.

3*a*. Cell elongate and rather broad, P. Darsius, and Plateni.

3*b*. Cell very broad, P. Hippolytus and vars.

3*c*. Cell broad but not elongate, all other species. [The form of the cell varies in the different species.]

4. The Pseudoneura generally invisible, but 3 or 4 in number. In Hippolytus, 3 in number, the central one originating at the base of the cell, and the 1st and 3rd branching in each side half way of its length.

4*a*. The pseudoneura 4 in number, the 1st originates at the base, the 2nd at the base, the 3rd as a branch of the 2nd half way, and the 4th at the base to half the length of the cell. [A good light and careful examination is required to detect them at all, as they are only like almost invisible folds.] Nearly all the species.

5. Posterior wings half the width or length of the anterior wings, the genus Trogonoptera.

5*a*. Posterior wings nearly 2-3rds the length of the anterior wings, P. Hippolytus and vars., Vandepolli and var., and all other species. [The proportion slightly varies in some of the species.]

AA.—ANTERIOR WINGS.

1. The sexes resemble each other partially in colour, genus Trogonoptera.

1*a*. Wings dark brown or black, with light adnervular rays, P. Hippolytus and vars., ♂ ♀, Vandepolli ♀; Honrathiana ♀, Plato ♂ ♀; Criton and Critonoides ♀, Naias ♂ ♀, Papuensis, Pompeus and Cerberus, Plateni, Dohertyi, Iris, Staudingeri, Miranda, Magellanus, Haliphron, Æacus, Rhadamantus and Fasciculatus, (*the females of all of these*).

1*b*. Wings with faint or nearly obsolete adnervular rays, Vandepolli and var., Criton and vars., Critonoides, Nereis, Cerberus, Plateni, Dohertyi, Iris, Darsius, Minos, Æacus, Rhadamantus, (*the males of these*).

1*c*. Wings with the adnervular rays green and leaf-like, T. Brookeana ♂, and Trojana ♂, and T. Brookeana, v. *Eleanor* ♀.

1*d*. Wings with the rays partly green and partly white and nearly leaf-like, Brookeana and Trojana ♀.

1*e*. Wings with the rays yellow, Amphrysus and vars., Neomiranda, Magellanus, (*all males*).

1*f*. Wings with no rays, Criton, Helena and vars., Pompeus, Andromache, Riedeli (*all males*).

1*g*. Wings almost entirely white, with no rays, Andromache ♀.

1*h*. Wings black with a blue gloss, Miranda ♂.

BB.—POSTERIOR WINGS.

2. Wings green and brown black, T. Brookeana ♂ ♀.

2*a*. Wings black, green and blue, Trojana ♂.

2*b*. Wings brown, blue, green and white, Trojana ♀.

2*c*. Wings black, yellow and white, P. Hippolytus and vars., ♂ ♀.

2*d*. Wings black and yellow, Vandepolli and var., Hephæstus, and both sexes of all other species except the following:

2*e*. Wings black, Dohertyi ♂.

2*f*. Wings yellow and opalescent, Magellanus, both sexes.

3. Wings with black suborbicular discal spots, P. Hippolytus and vars., Criton and vars., Critonoides, Naias, Papuensis, Melpomona, Hycetus, Hephæstus (*all females*).

3*a*. Wings with black discal cones, Cuneifera ♂, Vandepolli and var., Plato ♀ (Felder's type), Helena (type); Cerberus, Pompeus, Miranda, Darsius, Minos, Riedeli, Æacus, Andromache (*all females*).

3*b*. Wings with very broad black margin occupying the greater portion of the disc, and enclosing a transverse row of yellow or light spots, P. Plato, Critonoides, Amphrysus and vars., Andromache, Cuneifera, (*all females*).

3*c*. Wings with an extensive area of discal black and no transverse row of yellow marks, P. Plateni, Iris, Staudingeri, Rhadamantus (*all females*).

3*d*. Wings nearly entirely black, Plateni ♂; Doherty ♀, Miranda ♀.

3*e*. Wings entirely black, Dohertyi ♂.

3*f*. Wings with a transverse black band, a submarginal band of yellow marks, and an outer marginal band of black cones, Magellanus ♀.

3*g*. Wings with yellow disc, and outer marginal more or less broad black band, Vandepolli and var., Criton and vars., Naias, Helena and vars., Iris, Staudingeri, Neomiranda, Darsius, Minos, Riedeli (*all males*).

3*h*. Wings with the marginal band lunate and narrow, Amphrysus, Cuneifera, Nereis, Pompeus, Cerberus, Miranda, Andromache, Magellanus, Æacus, and Rhadamantus (*all males*); Hycetus ♀.

3*i*. Wings with marginal black band of lunations, very small and disconnected, Ruficollis, Flavicollis and Sumatrana (*all males*).

C.

1. Species closely resembling each other in the male sex; (*a*) Nereis, Pompeus, and Cerberus; (*b*) somewhat alike, Criton, Naias and Iris; Staudingeri and Plato; (*c*) Miranda and Andromache; (*d*) Æacus and Rhadamantus; (*e*) Darsius, Minos, Neomiranda (posterior wing), and Vandepolli.

1*a*. Of the female sex; (*a*) Dohertyi and Nereis; (*b*) Æacus, ♂, Plato, Criton, Cerberus, Pompeus, and Hephæstus.

D.

1. Females larger than the males, P. Hippolytus and vars., Criton, Naias, Cuneifera, Nereis, Pompeus, Plato, Cerberus, Plateni, Iris, Staudingeri, Miranda, Andromache, Æacus, and Rhadamantus.

1*a*. Males and females nearly of the same size, T. Brookeana, Trojana, P. Vandepolli and var., Critonoides, Papuensis, Melpomona, Amphrysus, and vars., Dohertyi, Magellanus, and Helena and some of its vars.

E.—MALE COLOURATION AND PATTERNS.

1. Discoidal cell of anterior wing immaculate, T. Brookeana (both surfaces); Trojana (both surfaces); P. Criton, Critonoides, Papuensis, Melpomona, Nereis, Pompeus, Cerberus; Dohertyi, Miranda, Helena, Carolus, Riedeli (each on both surfaces); Andromache, Plateni, Vandepolli, Staudingeri, Plateni, Darsius, Æacus, Rhadamantus, Sulaensis (upper surface only of each).

1*a*. Cell of ♀ anterior wing immaculate, T. Brookeana, and v. Eleanor, Trojana (upper surface of each); P. Miranda (both surfaces).

1*b*. Under surface of anterior wings with green and white marks, Brookeana.

1*c*. With green and blue marks Trojana.

1*d*. With white marks, Hippolytus, Critonoides, Naias, Helena and vars., Nereis, Pompeus, Cerberus and vars., Plateni, Iris, Staudingeri, Miranda, Riedeli, Darsius, Minos, Rhadamantus, Æacus, Hephæstus, Magellanus.

1*e*. Undersurface of anterior wings almost entirely or partially white, Andromache, Dohertyi (some varieties), Carolus.

1*f*. Undersurface of anterior wings with yellow-white, yellow and white, or yellow marks, Amphrysus and vars.

1*ff*. Undersurface of anterior wings of ♂ yellow, Neomiranda, Andromache, Cuneifera, Sumatranus.

2. Undersurface of the posterior wings with the marks white and blue, Brookeana, Trojana.

2*a*. With the marks black, white and yellow, Hippolytus and vars., Vandepolli and var., Critonoides.

2*b*. With the colours black and yellow only, all other species and varieties, except

2*c*. With yellow, and opalescent, Magellanus.

EE.—FEMALE COLOURATION AND PATTERNS.

3. Posterior wings on the undersurface white, black, and blue, Brookeana.

3*a*. Brown, white and blue, Trojana.

3*b*. Black, white and yellow, Hippolytus and vars., Plateni.

3*bb*. With Opalescence added, Magellanus.

3*c*. Black and pale yellow, Vandepolli, Amphrysus, Hycetus.

3*d*. Black and yellow, Plato, Naias, Hephæstus, Andromache, Vars. of Amphrysus, Papuensis, Pompeus, Cerberus, Miranda, Andromache, Darsius, Minos, Æacus, Rhadamantus, Hephæstus.

3*e*. Black and buff, Helena, Criton, Critonoides, Nereis.

3*f*. Black and rufus white, Melpomona, Dohertyi, Iris.

BBB.—POSTERIOR WINGS.

3. Upper and under surfaces of posterior wings alike; Helena and vars. ♂, Criton ♂, Critonoides ♂, Nereis ♂, Neomiranda ♂, Haliphron ♂; Amphrysus and vars. ♀, Hephæstus ♀, Hycetus ♀; Plato ♂ ♀, Naias ♂ ♀, Pompeus ♂ ♀, Cerberus ♂ ♀, Iris ♂ ♀, Staudingeri ♂ ♀, Miranda ♂ ♀, Andromache ♂ ♀, Magellanus ♂ ♀, Darsius ♂ ♀, Minos ♂ ♀, Riedeli ♂ ♀, Æacus ♂ ♀, Rhadamantus ♂ ♀.

F.—THE ABDOMEN.

1. Black or brown. The Genus Trogonoptera; P. Honrathiana ♂ ♀ ; Iris ♂ ♀ ; Riedeli ♂ ♀.
   1*a*. Black and yellow or brown, yellow and red, Hippolytus and vars. of ♂ ; Vandepolli, Plato, Criton, Critonoides, Naias, Helena and vars., Amphrysus, Cuneifera, Sumatrana (red, brown, and yellow), Nereis, Hycetus ♀, Pompeus, Cerberus, Staudingeri, Andromache, Æacus, Rhadamantus, Haliphron, Darsius and Minos (*both sexes of each*).

   1*b*. Grey-white and yellow, Hippolytus and vars., ♀.
      1*c*. Rufous white and yellow, Ruficollis and Flavicollis ♂ ♀.
         1*d*. Brown or black, grey-white and pale yellow, Plateni ♂ ♀.
            1*e*. Brown, rufous and yellow, Dohertyi, ♂ ♀.
               1*f*. Yellow, Neomiranda ♂ ; Miranda ♂.
                  1*g*. Buff white and yellow, Magellanus ♀.
                     1*h*. Anal valves of ♂ generally buff coloured, with a triangulate black dorsal mark uniting the anal with the penultimate segment.

G.—THE THORAX.

1. Thorax black, with red pronotal collar, and pectoral red, Trogonoptera, both sexes.
   1*a*. Thorax black, with no red parts, Hippolytus and varieties, both sexes.
      1*b*. Thorax black, with thin red pronotal collar. All species except the following :—
         1*c*. With yellow pronotal collar, and no red pectoral spots, Flavicollis ♂ ♀ ; Miranda ♀.
            1*cc*. Without yellow collar, Miranda ♀ var.
               1*d*. With white pronotal collar, and no red pectoral spots, Neomiranda ♂.
                  1*e*. Entirely black, Miranda ♂.

H.—HEAD.

1. Eyes brown, dark or light brown ; sometimes nitid ; slightly underlined white, or not at all ; moderate size, all species of both genera.

I.—ANTENNÆ.

1. Equal in length to the abdomen, and black, all species of both genera.
   1*a*. Moderately stout, curved towards the apex, and graduated in thickness, all of both Genera.

K.—THE LEGS

1. All black. A pair of sharp minute spines at the end of the tibia of each leg, and at the termination of each tarsus. (*All species.*)
   1*a*. The measurements of the parts of the legs vary in the different species as they do in the Genera included in Vol. I.
      1*b*. The ungues bifid and slightly bulbose at the base ; thickly clothed with minute spines, especially on the tibia and tarsi ; the femur with a minute groove or depression. (*All species*).

L.

[The abdominal or interior margin of the male posterior wings with a fold or pouch, which conceals the *androconia*. This fold varies in shape in the different genera, but is almost always present in the ♂ ♂ of the S. American Ornithopterina, and always in the Genera Trogonoptera and Pompeoptera. The margin of the wing is folded back over a part of the submedian area to the submedian vein—sometimes a little beyond, and forms a sort of tube for the contents ; a small portion of its basal part is sometimes again folded back in a short curve. The colour is always brown or black, and as the submedian area is generally of the same colour, in a specimen newly emerged it is difficult to detect the outline of this fold. The undersurface is generally lighter in colour—a nitid, rufous brown, and the abdominal black or brown fringe of curved hairs is attached to the edge of the fold on this surface, so that when the insect is resting, these hairs meet from the opposite wing, and serve as a hairy channel in which the subdorsum reposes.]

THE WING SCALES OF THE ORNITHOPTERA.

In Plates 58 and 59 of this work I give a series of figures of the scales which serve to ornament the wings of some of the species included in the tribe Troides. I do not profess to have drawn all the varieties that might, by careful examination with the microscope, be discovered; for although the two plates contain an aggregate of 84 figures, very many more might be added. The forms of the Lepidopterous scales are exceedingly numerous in all the groups. Lyonnet, in his posthumous memoirs, filled several quarto plates with representations of the scales found on the wings and body of the European goat moth *Cossus Ligniperda*, no two of them being precisely alike. It would be impossible to determine the limits of species or genera by the characteristics of these scales, so far at least as the Troides are concerned; for some of the forms are common to all the genera and species, though others appear to be peculiar to special species. But in these genera which are provided with *Androconia* there are at least two types: those of *Ornithoptera* and *Ætheoptera* in form being quite unlike their analogues in *Trogonoptera* and *Pompeoptera*. In the first two genera they consist of a multitude of exceedingly minute scales of 2 or 3 forms situated on the pupæ-form ♂ stigma of the anterior wings (see pl. 58, figs. 36), while in the latter they consist of an immense aggregation of long silky hairs of almost immeasurable tenuity, contained in a fold or pouch of the abdominal margin of the wing. In *Schoenbergia* and *Drurya* this character of scale appears to be absent, though I have no doubt some scales or hairs may ultimately be found, which serve a similar purpose in the economy of the insect.

The general scales are attached to the membranous surface of the wing by the slender stem or peduncle at their base; in some cases, perhaps in all, this peduncle throws out delicate rootlets, by which the peduncle is probably rendered more secure in its insertion into the minute indent of the membrane. Contrary to the popular idea these scales are generally so firmly fixed in position, that it is by no means an easy task to denude the membrance of even a few scales. This, at any rate, is true of many of the diurnal lepidoptera, though it is often otherwise in some of the Heterocerous Lepidoptera.

The scales may almost be divided into groups, for some are quite oval, or suboval, others are wedge-shape, leaf-like, petal-shaped, or like fish scales; often dentate at the apex, with 2 to 7 or even more dental notches—these notches generally varying in length and width in the same scale. Other scales are very narrow and relatively long. They are formed always of two lamellæ—sometimes (perhaps ?) of three. But in Troides I cannot satisfy myself of the existence of more than two. They are always granulated or striated on one or both surfaces—sometimes quite from their base; but often the basal and lateral portions for a short distance are simply transparent, from the absence of striæ. On many of the scales there are cross striæ; the striæ are generally parallel to each other; sometimes these are duplicated and run the entire length of the scale; or they form rows of oval or rounded dots. Their colours vary greatly when microscopically examined, even those taken from the black areas of the wing: for some may be blue, violet or green; and I can find no absolutely black scales—though many were very dark and almost opaque—caused by the closeness and immense number of their granulations and striæ. Between the striæ are many pigment cells; but the way the sculpturing of the scales is arranged decides whether they shall give off prismatic colours or not. Some of the scales from golden yellow surfaces are warm green or rosy pink; and others from green or brown areas are nearly white and very diaphanous.

Dr. F. Urech, in Zool. Anzeig, vol. 15, pages 305-6 (1892), divides the scales of the Lepidoptera into 5 classes, according to the various phenomena that they exhibit:—1. Scales only containing chemical colouring matters, and which exhibit no interference colours, found on the wings of the *Vanessas* and other species. 2. Scales which contain chemical colouring, and also interference colours, found on the wings of the *Vanessas* and other species. 3. Scales which exhibit interference colours on the wings, and possess also colouring matters which are soluble in water, as in the *Lycænidæ*. 4. Scales in which the colours are due to an underlying layer, as in the blue and violet scales of some *Vanessas*. 5. Variously coloured overlying scales which exhibit mixed colours, as in Papilio (and some of the Ornithoptera.

These 5 classes do not really include those connected with the sexual markings, which are generally found to be scent scales, intended either to attract the other sex or to repell undesirable visitors or foes; for as Burmeister and E. Haase have shewn, there is what they call *a tire-spur* (Schienensporn) which is sometimes found on the antennæ—a secondary sexual character, intended to aid attraction. In it is a gland which appears to moisten the olfactory organ in the antennæ. In specially well developed feelers of the ♂, and on the plump wingless females of some of the Geometræ, we are told it is absent, and only occurs in the Heterocera when both sexes are capable of flight.

These differ materially from those found on the pupæform or other sexual marks, and unlike the latter are not restricted to the male sex. In the Ornithoptera a peculiar form of wing is associated with the presence of these scales; and the fragrance is scattered by long mobile tufts of scale hairs, or rubbed off by the so-called rubbing spots (*Reibeflecks*). In the Heterocerous Genus Hypsa other hard scales appear to produce a shrill sound. E. Haase speaks of the scent organs, and remarks that they are defensively repellant, as in other Genera. They are sometimes scattered on the wings, but a local arrangement is more common. The positions which they occupy among the Diurnal and Heterocerous Lepidoptera are very varied, as I have shewn in Vol. I of this work, thus :—

They are situated on the upper surface of the anterior wings of the *Ulysses* and *Paris* groups of Papilios as plumiform stripes, parallel to some of the lower veins; also in *Peranthus*, and *Argynnis;* on the undersurface in the beautiful *Bizones* and *Celerena;* often on the posterior wings only—in *Erebus* and *Nyctipao* on the costal margin of the posterior wings, also in *Argiva* and *Patula* in a fold; on the upper side of the wing in *Eronia*, *Ideopsis*, *Danais*, *Amathusia*, *Ragadia*, &c.; on the abdominal marginal area in *Morpho;* on the lower surface in *Plecoptera;* in a costal fold of the anterior wings in some of the *Lycænidæ* and *Hesperiidæ*, and in a large aggregated mass on the femur and tibia of some of the *Erebidæ*, and sometimes near the apex of the antennæ of some *Pyralidæ;* on the thorax of *Chærocampa*; on the abdomen in some of the *Sphingidæ* and *Agaristidæ*, and also some Noctuæ. In almost all *Danaidæ*, &c., they lie near the genital aperture; on the palpi in *Bertula* and some of the lovely Pyralidæ, or on the 1st pair of feet, also on the appendages in *Ismene* of the Hesperid butterflies, *Caprila*, and *Hyblæa* among the noctuid moths, &c. The lines or striæ on some of the wing scales are often one-100,000th of an inch thick; and Royston-Pigott says, "they are apparantly a kind of flattened hairs, most of which are hollow, and similarly endowed with molecules containing an oily sap." If this be so, it will go far to explain why certain species of Lepidoptera fade so terribly when exposed to the light, by the chemical destruction of this oily material. Those species with colour-interference scales do not suffer much from this cause.

As I have shewn above, the scales of the Ornithoptera alone are so varied in form, that it would be difficult to exhaust their possibilies; to figure and describe all their variations in the Lepidoptera would require the united lifetimes of several students. Dr. H. Burmeister, as the result of his study of the scales of the species of *Castnia*, which are the largest of any insect, shows that they do not enclose any third membrane, but are empty,—the two membranes of which they are composed do not touch each other, there being a certain space between them. The coloured ones contain a coloured fluid at the commencement of the scale, which dies little by little by the action of the air, and leaves a deposit on the inner surface of the two membranes, this fluid being finally replaced by the air entering through the membranes, which remain soft for a short time after the formation of the scale.

The colouring matter seems to be principally attached to the upper membrane, rendering it opaque, while the lower one is more transparent from the absence or partial absence of the deposit. The longitudinal striæ belong entirely to the upper membrane of the scales, and are wanting in the lower. In the Ornithoptera I do not find that this rule holds good; for when examining broken scales, especially from the black areas of the wings, it is possible to easily detect the same striæ on the lower membrane; and some of them can be seen through the upper membrane. The breadth of the spaces between the lines is greater than that of the lines themselves. The lines are generally of equal breadth, but sometimes a thick and thin line will alternate; in some of the Ornithoptera these lines are duplicated in both thicknesses, as are the latitudinal or transverse lines. The thick lines correspond to the teeth or indentations of the margin (somewhat as the curved ribs of the Pecten shells of the Mollusca do), and the thin lines to the intervals between them. The transverse lines which appear to divide the longitudinal into squares or trellis work are really produced by the striæ on the lower membrane showing through the upper one. Hence have originated many errors in the appreciation of the structure of the scales. Dr. Royston-Pigott in investigating with a power of 3,000 the striated surfaces of these scales, decided that though appearing approximately, they are really covered with villi, chenille or velvet pile, teminating in a spherule! the recognised object of these striæ, regarded as corrugations, being to give strength to a most delicate tissue, which are again supported by cross striæ. "Upon the latter," he said, "are villi erected upon them by twos and threes, and summits consisting of a refracting spherule." Later investigations however have quite invalidated his theory, which was based on the study only of the scales of *Vanessa Atalanta*, The Red Admirable.

For a fuller study of this subject, reference may be made to the following bibliography :—

Burmeister, "Physical Description of the Argentine Republic," Vol. V. Lépidopterès, part 1, page 21 (1878).

Royston-Pigott, " Note on the structure of Butterflies' Scales," *English Mechanic*, Vol. xl., p. 245 (1884).
E. Haase, Ber. 59 Versammlg. Deutsch. Naturforscher u. Aerzte Berlin." XIX. p. 510 (1886).
E. Haase, " Bull. Soc. Ital. xxii., pp. 138-143 (1891).
Von. Reichenau, " Journal of the Royal Microscopic Society, iii., p. 938 (1880).
K. Fügner, " Entomol. Nachrichten," vi. pp. 166, 7 (1880).
Dr. Royston-Pigott, " Proc. Royal Soc.," Vol. xxxi., pp. 505, 506 (1881).
Watson, " On the scales of Battledore Butterflies " in *The Monthly Microscopical Journal*, Vol. ii., pp. 73, 314.
Dr. Maddox, " On the General and Particular Construction of the scales of some of the Lepidoptera," in the same Journal, Vol. v. p. 247.
Dr. Anthony " On the markings on the Battledore Scales of some of the Lepidoptera," the same work, Vol. vii. pp. 1, 250.
Dr. Carpenter, " The Microscope and its Revelations," 5th Edition, pp. 692-702 (1875).

In the microscopic study of these scales it will be advisable to examine them chiefly with eomparatively low powers. With good lighting a 1-3rd or a 4-10ths objective will give a lot of information that is trustworthy; while in the use of the higher powers, the possibility and even certainty of error, increases with every additional increase of attempted definition, even in the hands of the greatest experts, as they themselves will readily acknowledge.

In the Plates illustrating this subject, I have contented myself with doing little more than drawing the outlines of the various scales belonging to the Ornithoptera—merely indicating in some figs. the nature of the detail. To have given it in full in every case would have needed that the figures should be engraved on steel, to do them justice. My object has been chiefly to give accurate sketches of the forms, without reference to scale. Very many more might have been added, for the amount of variation in form is an unknown quantity.

THE FIGURES ON PLATE 58.

Fig. 1. Genus Pompeoptera, from near the base of the anterior wing.
,, 2. ,, ,, ♂ from the same area.
,, 3. ,, ,, Minos, ♂ Basal short hair scale.
,, 4. ,, Ætheoptera Victoriæ ♀, *var.* white scale.
,, 5.
,, 6. Black scales of ♂ Ornithopterina.
,, 7.
,, 8.
,, 9. Red scales of the same.
,, 10. Genus Pompeoptera ♀, black scale.
,, 11. Genus Schoenbergia. Green scale of ♂ anterior wing.
,, 12. ,, ,, Yellow scale of ♂ posterior wing, the striation is very minute, and only on the upper surface.
,, 13. Pompeoptera Helena, ♀, black scale.
,, 14. Genus Pompeoptera ♀, yellow scale of posterior wing.
,, 15. ,, ,, ♂, yellow scale of posterior wing.
,, 15a. Sch. Goliath, ♂, blue-green or orange-red scale.
,, 16. Ornithoptera Obiensis, ♂ a blue-green scale from the undersurface of the posterior wing.
,, 17. Scale of Papilio Machaon, ♂.
,, 18. O. Obiensis ♂, green scale of undersurface.
,, 19. Papilio Eurybates, *Gray* ♂; one of the Ornithopterina, anterior wing, a blue scale.
,, 20. Sch. Goliath ♂, yellow and green scale.
,, 21. Papilio Eurybates ♂, red scale.
,, 22. *Genus* Pompeus, black abdominal scale.
,, 23. Ornithoptera Aruana, ♂, green scale.
,, 24. ,, ,, ♂, steel-blue scale.

Fig. 25. Ornithoptera Aruana, ♀, yellow scale.
,, 26. ,, ,, ♂, steel-blue scale.
,, 27. Papilio Eurybates, ♂, red scale.
,, 28. ,, ,, ♀, ,,
,, 28a. ,, black scale on the ♂.
,, 29. O. Aruana, ♂, black thoracic scale.
,, 30. *Genus* Pompeoptera, ♂, basal hair scale, black.
,, 31. O. Aruana, ♂, from the thorax, black.
,, 32. ,, ,, from the thorax, green.
,, 33. ,, ,, Abdominal scale.
,, 34. Trogonoptera Brookeana, ♂.
,, 35. Green scale from the thorax of O. Aruana ♂.
,, 36. Scales from the Pupæform stigma of Aruana.
,, 37. Trogonoptera Brookeana ♂, black twisted scale.
Figs. 38, 39, 40. T. Brookeana, from the base of the thorax.
,, 41, 42, 43. O. Aruana ♂, rufous scales from the undersurface of the abdominal margin.
Fig. 44. Androconia scale-hairs from the abdominal fold or pouch of the ♂ of P. Minos.

These hair-scales have a diameter many times less than that of a spider's web. Indeed as the web of some spiders is composed of a large number of silky threads, excerted at first in a fluid state through a multitude of minute tubes situated on the lower surface of the spinnerets, which unite, before their consolidation, to form a single thread, each strand being of extreme tenuity; these Androconian hair-scales may be considered as having a diameter only equal to a very small number of the strands which, by their union, go to form the web of the spider.

PLATE 59.

Fig. 1. Hair-scale from the thorax of the *Genus* Ornithoptera.
,, 2. P. Helena, ♀, brown elongate scale from the thorax. The majority of the forms differ little from this, but others are willow-leaf shape, and some with 2 or 3 dentations at the broad end.
,, 4. P. Cerberus, ♀, yellow scale. Striæ duplicated and alternated with lines of dots.
,, 3, 5, 16. P. Helena, ♂, black wing-scales.
,, 6. P. Cerberus, ♂, yellow wing-scale.
,, 7. *Genus* Papilio, blue scale of ♂ anterior wing. This figure is only intended for comparison with the others.
,, 8. Black abdominal scale of *Genus* Pompeoptera.
,, 9. P. Cerberus ♀, black. Anterior wing, undersurface.
,, 10. O. Obiensis ♂, green-blue scale, undersurface of anterior wing.
,, 11. P. Cerberus, ♀, black scale of posterior wing.
,, 12 or 13. *Genus* Pompeoptera ♂ or ♀, black wing scale; common to both sexes.
,, 14. *Genus* Pompeoptera, ♂ or ♀ yellow wing scales; common to both sexes.
,, 15. P. Minos, ♀, anterior wing, black scale.
,, 17. Ætheoptera Victoriæ ♀, white scale.
,, 18. O. Obiensis, ♂, blue scale from posterior wing.
,, 19, 20, 21. P. Helena ♂, thoracic hair scales. The forms vary, and some are 2-dentate or 3-dentate at the the broad end. They are striated and black.
,, 22. Pompeoptera Darsius, ♂ and ♀, long white scale.
,, 23, 24, 28. Schoenbergia Titan, ♂, blue, black or green forms: each with the same colours.
,, 25. P. Minos, ♂ or ♀, posterior wing, yellow scale.
,, 26, P. Darsius, yellow scale of ♂ or ♀ posterior wing.
,, 27. P. Minos ♂ or ♀ yellow scale from the abdomen.
,, 29. P. Minos, ♀, black scale from undersurface of anterior wing.
,, 30. Ætheoptera Victoriæ, ♀, white scale.
,, 31. *Genus* Pompeoptera, light scale, from the abdominal margin of the ♀.
,, 32. O. Obiensis, violet scale from near the base of the anterior wing.

,, 33. P. Æacus, ♂, black scale.
,, 34. P. Darsius, ♀, yellow scale.
,, 35. Ætheoptera Victoriæ ♂, a deep orange-red scale, striæ obscure, but indicated in the figure.
,, 36. P. Helena, ♂, black scale, anterior wing.
,, 37. P. Darsius, ♂, yellow scale, from posterior wing.
,, 38. O. Poseidon ♀, white scale.
,, 39. P. Helena, ♂ anterior wing black scale, dark double striæ, with white dots between.
,, 40. Ætheoptera Victoriæ, ♂, green scale of sub-costal band.

In the foregoing portions of this article I have only briefly, and I am sure very imperfectly, dealt with the scales of the Non-Acræoid Ornithoptera ; the following list is concerned with those of the Genus Drurya, which in Vol. 1. of this monograph precedes the other Genera ; and it will at once be seen that there is no great difference between the forms of Drurya and those of the other groups, though there is probably as great a diversity of them. The former are all Oriental species, the latter are West African, in which the two sexes resemble each other, differing but little, except in size, and of which the two species known at present are quite acræoid in appearance.

1.—DRURYA ANTIMACHUS.

The colours of the insect white, black, or brown, creamy-white, or yellow, Indian red, and a little blue.

Figs, 1, 2, 3, India-red scales with a blue tint, as seen under the microscope; from the upper surface of the anterior wing.

Fig 4. resembles No, 2, except in Indentation. The striæ not duplicated, but with transverse dots or lines.

Figs. 5, 6, 7, red scales.

,, 8, to 16, scales black, from near the base of the anterior wings.

Fig. 17, hair-like scale from the same area, black.

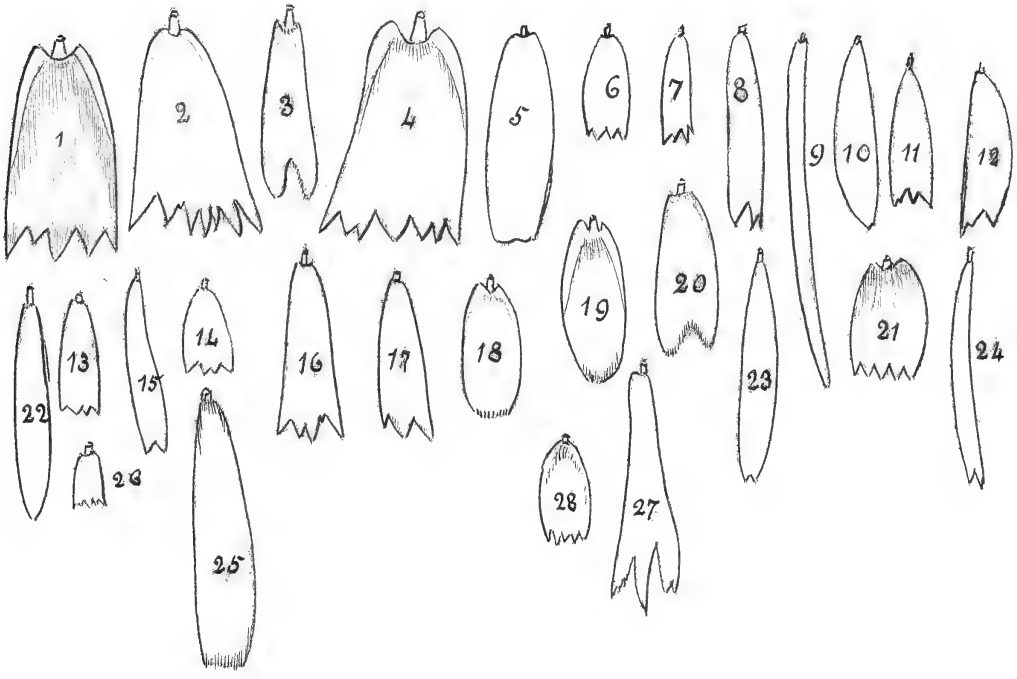
,, 18, blue scale from anterior wing, undersurface.

,, 12, 20, white, from the undersurface.

,, 21, 26, creamy-white or yellow-white from the undersurface.

,, 22, to 25, cream-coloured abdominal scales near the base of the abdomen.

,, 27, 28, from the abdomen, creamy-white.

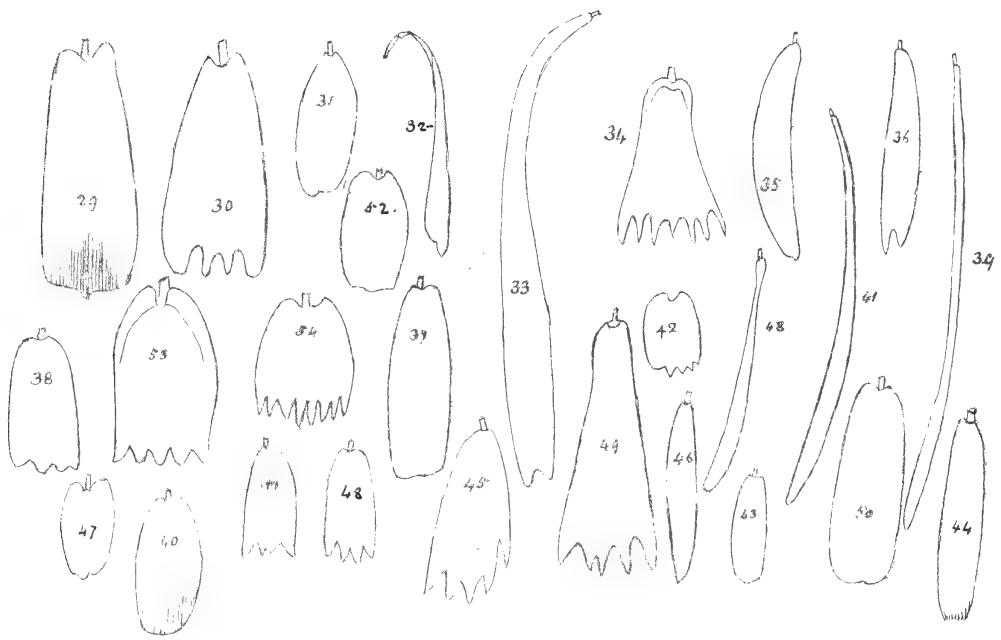


2.—D. ZALMOXIS.

The colours of the insect green-blue, brown-red and Venetian red, and black.

Figs. 29, 30, two dissimilar red scales from the posterior wings.
,, 31, 32, blue green, near the base of the anterior wing; 32 is foreshortened.
,, 33, from the same position, blue green,
,, 34, to 36, black.
,, 37, 38, red.
,, 39, a basal red hair scale; 40, 41, from the same position, but black.
,, 42, dentate scale, orange, from the abdomen, some of this class have 4 longer or 6 broader dentations.
,, 43, 44, black thoracic scales; but many are like No. 39.
,, 45, to 47, green blue, delicately striated; striæ duplicated, with alternate dotted lines.
,, 48, short hair-like blue scale, from near the abdominal margin.
,, 49, to 52, red discal scales.
,, 53, 54, orange scales from the abdomen.

Mr. Joseph Beck, in 1879 examined a large number of the scales of Lepidoptera, and he stated that he found invariably that the striæ (which he called *corrugations*) were situated only on the underside of the scale, or that nearest to the body of the insect. Nothwithstanding this statement, I have seen what appears to me unmistakable evidence that some of the darker scales of the Ornithoptera are striated on both surfaces. If so, then the longitudinal lines cannot be corrugations or folds of the membrane. Certainly it would be possible, but not probable.



CHRONOLOGICAL HISTORY OF THE TRIBE **TROIDES.**

The earliest mention or description of a species of Troides (or Ornithoptera) was published by Vicentius, "Mus. p. 10," in 1719. This species was *O. Priamus*, which I have taken as the type of the Genus Ornithoptera; the habitat was given as Amboina. Previous to this date, although the species must have been known to the Dutch naturalists at a much earlier period, as so large and splendid an insect would be very sure to have attracted attention, it does not appear to have been described or alluded to by the pre-Linnæan Entomologists. The next reference to Priamus was Musei, "Imp. Petr.," vol. i., p. 664, n. 9, in 1742. In 1745 the ♂ was alluded to by Aubenton, "Planch Enlum." text, p. 45; in 1759 by Linnæus, "Syst. Nat.," Edition x., page 458, note 1; and in 1765 by Seba, "Thesaurus" iv., p. 54, plate 44, with 2 figures of the ♀ (figs. 22, 23); in each author Amboina is again spoken of as the home of the species. From this date we may proceed in a systematic manner.

1719. **Papilio Eques Pompeus,** Madame Merian, "Insects of Surinam," Plate 72, figured *Pompeus* in mistake of its locality.
1753. **P. E. Trojanus Panthous** (the ♀ of *Pompeoptera Hippolytus*); Linnæus, "Systema Naturæ," Edition ix., page 461, note 16.
1758. **P. E. Panthous** (as the ♀ of *Priamus*) by Linnæus, "Systema Naturæ," Edit. x., page 451, note 1.
1758. **P. E. Priamus,** Linnæus, "Amœnitates Academicæ," vol. v., plate 3, fig. 203 (the ♂.)
1758. **P. E. Trojanus Panthous,** Linnæus, "Systema Naturæ," Edition x., page 461, note 16 (the ♀ of *Pompeoptera Hippolytus*).
1764. **P. E. Panthous** Clerck, "Icones Insectorum," ii., text 19 (the ♀ of *Priamus*).
1764. **P. E. Trojanus Panthous,** Linnæus, "Musei Ludovicis Ulricis," p. 195, n. 14 (the ♀ of *P. Hippolytus*).
1764. **P. E. T. Helena,** Clerck, "Icones Insectorum," vol. ii., plate 22, fig. 1 (the ♂).
1764. **P. E. T. Helena,** Linnæus, "Musei Ludovicis Ulricis," page 199, note 18 (the ♂ of *Hippolytus*).
1765. **P. Remus** Seba, Mas. 4, plate 46, pages 56, 57, figs. 11, 12, 19, 20 (the ♀ of *Hippolytus*).
1765. **P. Hippolytus,** Seba, "Thesaurus" vol. iv., p. 55, plate 45, figs. 17-20.
1767. **P. Eques Priamus,** Linnæus, "Systema Naturæ," Edit. xii., p. 744, n. 1 (the ♂ of *Priamus*).
1767. **P. E. Priamus,** Beckmann, "Anfangsgrund," p. 105, n. 1 (the ♂ of *Priamus*).
1767. **P. E. Trojanus Helena,** Houttuyn, "Naturl. Hist." vol. i., (ii.), page 20, note 18 (the ♂ of *Priamus*).
1767. **P. E. Panthous,** Houttuyn, "Naturl. Hist." vol. 1., (ii.), p. 199, n. 16 (the ♀ of *Priamus*).
1767. **P. E. T. Helena,** Linnæus, "Systema Naturæ," Edition xii., page 748, note 19 (the ♂ of *Hippolytus*).
1767. **P. E. T. Helena,** Müller, "Natursgeschichte," vol. i., page 571, note 18 (the ♂ of *Hippolytus*).
1774. **P. E. T. Panthous,** Müller, Natursgeschichte., vol. i., p. 571, n. 17 (a ♀ of *Priamus*.)
1775. **P. E. Panthous,** Fabricius, "Systema Entomologiæ," p. 448, n. 25 (the ♀ of *Priamus*).
1775. **P. E. Priamus,** Cramer, "Papillons Exotique," vol. i, plate 23, figs. A.B. (the ♂).
1775. **P. E. Trojanus Helena,** Fabricius "Systema Entomologiæ," page 449, note 28 (the ♂ of *Hippolytus*).
1775. **P. Pompeus,** Cramer, "Papillons Exotique," vol. i., plate 25, fig. A. (the ♂).
1775. **P. Hippolytus,** Cramer, "Papillons Exotique," vol. i, plate 10, figs. A.B., pl. 11, A.B.
1777. **P. Remus,** Fabricius, "Genera Insectorum," p. 250 (the ♀ of Hippolytus).
1777. **P. Eques Panthous,** Cramer, "Papillons Exotique," vol. ii., p. 39, plate 123, fig. A; pl. 124, fig. A. (the ♀ of *Priamus*).
1779. **P. E. Trojanus Helena,** Helena, J.A.E. Goeze, "Beiträge zur Entomologiæ," vol. iii. (i.), page 38, note 19 (the ♂ of *Hippolytus*.)
1779. **P. E. T. Minos,** Cramer, "Papillons Exotique," vol. iii., page 4, plate 195, fig. A. (the ♀).
1779. **P. Remus,** Cramer, "Papillons Exotique," vol. ii., plates 135a, 136a (the ♀ of *Hippolytus*).
1779. **P. Eques Trojanus Panthous,** J.A.E., Goeze, "Beiträge zur Entomologie," vol. iii. (1), p. 37, n. 17 (the ♀ of *Priamus*).
1781. **P. E. T. Astenous,** J. C. Fabricius, "Species Insectorum," vol. ii., page 10, note 38 (the ♀ of *Minos*).
1781. **P. E. Panthous,** J. C. Fabricius, "Species Insectorum," vol. ii., p. 9, n. 36 (the ♀ of *Priamus*).

1781. **P. E. Trojanus Helena,** J. C. Fabricius, "Species Insectorum," vol. ii., p. 10, n. 39 (the ♀ of *Priamus*).
1782. **P. E. Panthous,** Cramer, "Papillons Exotique," vol. iv., plate 386, A.B. (is Priamus ♀.)
1782. **P. Antimachus,** Drury, "Illustrations of Exotic Entomology," vol. iii., plate 1.
1782. **P. Eques Trojanus Amphrysus,** Cramer, "Papillons Exotique," vol. iii., p. 43, plate 219, fig. A. (the ♂).
1782. **P. E. T. Minos,** Jablonsky and Herbst, "Natursgeschichte Schmetterlinge," vol. i., page 206, note 7, plate 4, fig. 2 (the ♀).
1782. **P. E. Hippolytus,** Cramer, "Papillons Exotique," vol. iv., pl. 386, figs. A.B. (the true *Hippolytus*).
1782. **P. E. Priamus,** Blumenbach, "Handbüch" (is *Priamus*).
1783. **P. E. Panthous,** Jablonsky, "Natursgeschichte Schmetterlinge," vol. i., p. 207, n. 8, pl. 5, figs. 1, 2 (the ♀ of *Priamus*).
1783. **P. E. Trojanus Helena,** Jablonsky, "Natursgeschichte Schmetterlinge," (Natural History of Butterflies), vol. i., p. 203, n. 5, pl. 3, f. 2 (the ♂ of *Helena.*)
1784. **P. E. Trojanus Amphrysus,** Jablonsky," "Natursgeschichte Schmetterlinge" vol. i., page 197, note 2, plate 1, fig. 3 (the ♂).
1784. ? **P. Remus,** J. F. W. Herbst, "Archives des Insects Geschichte," (Records of Insect History), Papilio, plate 3, fig. 1 (is *Hippolytus* ♀).
1784. **P. Eques Priamus,** Esper, "Ausländisch Schmetterlinge" (Exotic Butterflies) vol. 11, pl. 1, f. 1 (is *Priamus*).
1785. **P. Antimachus,** Esper, "Ausländisch Schmetterlinge," plate 22, fig. 2.
1785-1798. **P. Eques Trojanus Pompeus,** Esper, "Ausländisch Schmetterlinge," plate 24, fig. 2 (the ♀).
1786. **P. Eques T. Helena,** Esper, "Ausländisch Schmetterlinge," p. 43, pl. 9, fig. 2 (the ♂ of *Helena*).
1786. **P. E. Priamus,** Esper, "Ausländisch Schmetterlinge," page 45, note 17, plate 10 (the ♀ of *Priamus*).
1787. **P. E. Trojanus Amphrysus,** J. C. Fabricius, "Mantissa Insectorum," vol. ii., page 3, note 23 (the ♂).
1787. **P. E. T. Helena,** J. C. Fabricius, "Mantissa Insectorum" vol. ii, p. 5, n. 42 (the ♂ of *Helena*).
1790. **P. E. T. Astenous,** Gmelin, "Systema Naturæ," vol. i. (5), page 2234, note 297 (the ♀ of *Minos*).
1790. **P. E. T. Helena,** Gmelin, "Systema Naturæ," vol. i. (5), p. 2234, n. 19 (the ♂ of *Amphrysus*).
1790. **P. E. T. Amphrysus,** Gmelin, "Systema Naturæ," vol. i. (5), page 2230, note 287 (the ♂).
1792. **P. E. T. Amphrysus,** Esper, "Ausländisch Schmetterlinge," page 133, note 59, plate 34, fig. 1 (the ♂).
1793. **P. Antimachus,** Fabricius, "Systema Entomologiæ," vol. iii., part 1, page 11, note 31.
1793. **P. Eques Trojanus Helena,** J. C. Fabricius, "Systema Entomologiæ," vol. iii. (1), p. 19, n. 59 (the ♂ of *Pompeus*). Ibid, p. 18, n. 56 (the ♀ of *Priamus*).
1793. **P. E. T. Amphrysus,** J. C. Fabricius "Systema Entomologiæ," vol. iii. (1), page 11, note 33 (the ♂).
1793. **P. E. T. Astenous,** J. C. Fabricius, "Systema Entomologiæ," vol. iii. (1), page 19, note 58 (the ♀ of *Pompeus*, also Ibid to *Pompeus*).
1800. **P. Priamus,** Donovan, "Insects of India," page 16 (the ♂).
1800. **P. Heliacon,** Donovan, "Insects of India," plate 18, fig. 1 (probably refers to *Cerberus*, not *Pompeus*).
1804. **P. Priamus,** C. P. Thunberg, "Musei Naturæ Upsala," (the Upsala Museum of Nature), vol. xxiii., page 9.
1806. **P. Priamus,** Turton, "System of Nature," vol. iii., page 10 (2), plate 65.
1806. **P. Priamus,** Shaw, "General Zoology," vol. vi., page 207, plate 65.
1815. **P. Priamus,** var. Quoy et Gaimard, "Voyage de' l Uran," page 557, plate 83, fig. 3 (the ♂ of *O. Poseidon*).

1816. **TROIDES,** *Genus,* Hübner, "Verzeichniss bekannt Schmetterlinge" (List of Known Butterflies) page 87.

1816. **T. Priamus,** Hübner, "Verzeichniss bekannt Schmetterlinge," page 88, note 919 (the ♂ of *Priamus*).
1816. **T. Priamus,** Hübner, "Sammlung Exotische Schmetterlinge" (Collection of Exotic Butterflies), vol. ii., plate 116-117 (the ♂ and ♀ of *Priamus*).
1816. **T. Astenous,** Hübner, "Verzeichniss bekannt Schmetterlinge," page 88, note 933 (the ♂ of *Pompeus*).
1816. **Papilio Amphimedon,** Cramer, or *Troides Amphimedon,* Hübner, "Verzeichniss bekannt Schmetterlinge," page 88, note 920 (the ♀ of *Helena*).
1816. **Troides Helena,** Hübner, ibid, page 88, note 920 (the ♂).
1816. **T. Amphrysus,** Hübner, "Verzeichniss bekannt Schmetterlinge," page 88, note 923 (the ♂ of *Amphrysus*).
1819. **P. Amphrysus,** var., Godart, "Encyclopédie Méthodique," vol. ix., page 27, note 7 (*Pompeus* form of ♂).
1819. **P. Remus,** Godart, "Encyclopédie Méthodique," vol. ix., page 26, note 3 (the *Hippolytus* form).
1819. **P. Panthous,** Godart, "Encyclopédie Méthodique, vol. ix., page 25, note 2 (the ♀ of *Priamus*).
1819. **P. Hellen,** Godart, page 27, note 6 (l c.) (refers to *Helena*).
1819. **P. Antimachus,** Godart, "Encyclopédie Méthodique," vol. ix., page 28, note 8.
1821. **P. Astenous,** Kotzebue, "Reise," vol. iii., page 205, plate 4, figs. 6a, 6b, 6c (the ♂ and ♀ of *Rhadamantus*, Lucas).

1825. **P. Antimachus,** Donovan, "Natural History Repository," vol. iii., plates 100-101.
1828. **P. Priamus,** Thon, "Entomologie Archipel," page 124 (the ♂).
1828. **P. Priamus,** var, Thon, "Archives de Entomologie," page 125 (the ♂ of *Poseidon).*
1829. **P. Urvilliana,** Guérin, "Voyage de la Coquille," plate 13, figs. 1-2.
1832. **P. Priamus,** Boisduval, "Voyage de l' Astrolabe," plate 4, figs. 1-2 (a ♀ of the var. *Archideus*).

1832. **ORNITHOPTERA,** (*Genus*), Boisduval, "Faune de l' océanie," (deals with the animal life of the Eastern Archipelagos), plate 4, fig. 1.

1832. **ORNITHOPTERA** (*Genus*), Boisduval "Voyage de l' Astrolabe," *Lepidoptéres*, page 33.

1832. **O. Priamus,** Boisduval, "Voyage de l' Astrolabe, *Lepidoptéres*," page 33, note 1 (the ♂).
1835. **O. Rhadamantus,** Lucas, "Lépidoptéres Exotique," page 5 (♂ and ♀ of the species).
1835. **O. Amphrysius,** Lucas, "Lépidoptéres Exotique," plate 2, fig. 1, "lisez rhadamantus au lieu d' *Amphrisius*," Lucas (the ♀ and *var. a* of Rhadamantus).

1833. **AMPHRISIUS,** *Genus*, Swainson, "Zoological Illustrations of Insects," 2nd series, plate 98.

1833. **A. Nymphalides,** Swainson, "Zoological Illustrations of Insects," vol. ii., plate 98 (is the species *Pompeus*).
1836. **P. Priamus,** Boisduval, "Spécies Géneral des Lépidoptéres," vol. i., page 174 (a ♀ of the variety *Archideus*).
1836. **Ornithoptera Urvilliana,** Boisduval, "Spécies Géneral," vol. i., page 175, note 2, plate 17, fig. 1 (in "Suites a Buffon, Lépidoptéres.")
1836. **O. Pompeus Heliacon,** Boisduval, "Spécies Géneral Lépidoptéres," page 18 (is *Pompeus* or *Cerberus* ?), Boisduval regarded *Pompeus* as a Synonym of *Heliacon.*
1836. **O. Remus,** Boisduval, "Spécies Géneral Lépidoptéres," page 176, note 3 (is *Hippolytus*).
1836. **O. Heliacon,** Boisduval, "Spécies Géneral Lépidoptéres," vol. i., page 178, note 7 (♀ of *Minos*).
1836. **O. Rhadamanthus,** Boisduval, "Spécies Géneral Lépidoptéres," vol. i., page 180, note 8 (not the ♂, and ♀ *var. a* of *Rhadamantus*, Lucas, but of *O. Æacus* of Felder), Rothschild, in his "Revision of the Eastern Papilionidæ, Novitates Zoologicæ," vol. ii., remarks "Boisduval's *Rhadamanthus* is a composite species of a Philippine Island ♂, and the ♀ of the Indo-Chinese representative species; and var. a is the proper ♀ of the Philippine ♂; so the name of *Rhadamanthus*, Boisduval, was used for the Indo-Chinese, and not for the Philippine one. Gray first made the mistake, and others have followed."
1836. **Papilio Antimachus,** Boisduval, "Spécies Géneral Lépidoptéres," page 188, note 1.

1836. **ORNITHOPTERUS,** J. O. Westwood, "Introduction to the Modern Classification of Insects," vol. ii., page 348 (not characterised as a Genus).

1836. **ORNITHOPTERA** (*Genus*), Boisduval, "Spécies Géneral Lépidoptéres," vol. i., page 173.

1836. **O. Amphrysius,** Boisduval, "Spécies Géneral Lépidoptéres," vol. i., page 178, note 6, plate 1B, fig 1, the ♂, (but the two sexes are described).
1836. **O. Haliphron,** Boisduval, "Spécies Géneral Lépidoptéres," vol. i., page 181, note 9 (the ♂).
1837. **Papilio Priamus,** Thon, "Natursgeschichte Schmetterlinge," (Natural History of Butterflies), page 16.
1837. **P. Remus,** Duncan, "Foreign Butterflies," page 92, plate 1, fig. 2 (is *Hippolytus*).
1837. **P. Remus,** Westwood, Edit. of Drury's "Illustrations of Exotic Entomology," vol. iii. page 1, plate 1.
1841. **Ornithoptera Tithonus,** De Haan, "Verhandelingen over de Natuurlijke Geschiedenis der Nederlandsche overzeeche Bezeltingen," page 18, plate 1, fig. 1 (the ♂). This work treats of the Natural History of the Netherland Transmarine Colonies, or Netherland Indies as they are called now.
1841. **O. Priamus,** Blanchard, "Histoire Naturélle des Insects," p. 420, note 1 (the ♂ of *Priamus.*)
1845. **O. Amphimedon,** Doubleday, "Genera of Diurnal Lepidoptera," vol. i., page 4, note 6, plate 1, fig. 2 (the ♂ of *Darsius*).
1846. **O. Tithonus,** E. Doubleday, "Genera of Diurnal Lepidoptera," page 4, note 4 (the ♂).

1846. **ORNITHOPTERA,** *(Genus),* Doubleday and Hewitson, "Genera of Diurnal Lepidoptera," vol. i., page 5.

1846. **O. Urvilliana,** Doubleday and Hewitson, "Genera of Diurnal Lepidoptera," vol. i., page 42.
1846. **O. Panthous,** Doubleday, Westwood and Hewitson, "Genera of Diurnal Lepidoptera," vol. i., page 4, note 5 (is *Hippolytus* of both sexes).
1846. **O. Poseidon,** Doubleday Westwood and Hewitson," Genera of Diurnal Lepidoptera," vol. i., page 43.

1846. **Ornithoptera Rhadamanthus,** Doubleday, Westwood and Hewitson, "Genera of Diurnal Lepidoptera," vol. i., page 4, note 10 (the two sexes of *Æacus* of Felder).

1846. **O. Amphrysius,** Doubleday, Westwood, and Hewitson, "Genera of Diurnal Lepidoptera," vol. i., page 4, note 8 (is *Amphrysus).*

1846. **O. Priamus,** Doubleday, Westwood and Hewitson," Genera of Diurnal Lepidoptera," vol. i., page 4, note 1 (the ♂ and ♀.)

1847. **O. Poseidon,** Doubleday, "Annals and Magazine of Natural History," vol. xix., page 173.

1848. **O. Poseidon,** Westwood, "Cabinet of Oriental Entomology," plate 11 (the ♂), plate 14 (the ♀).

1849. **O. Urvilliana,** D'Orbigny, "Dictionaire d'Histoire Naturélle, Atlas Zoologique," vol. ii., plate 1.

1852. **O. Darsius,** Gray, "Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 5, note 11 (the two sexes).

1852. **O. Pronomus,** Gray, "Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 2, note 3, plate 1, figs. 1, 2 (var. of *Poseidon*).

1852. **O. Archideus,** G. R. Gray, "Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 3, note 4 (variety of *Poseidon*).

1852. **O. Poseidon,** Gray, "Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 3, note 5 (the ♂ of *Poseidon*).

1852. **O. Urvilliana,** Gray, "Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 4, note 7.

1852. **O. Panthous,** Doubleday; G. R. Gray, "Catalogue of the Lepidopterous Insects in the British Museum" (the ♀ of *Hippolytus*).

1852. **O. Pompeus,** G. R. Gray, "Catalogue of the Lepidopterous Insects in the British Museum," vol. i., page 5, note 13 (the ♂ and ♀ of *Cerberus*).

1852. **O. Euphorion,** Gray, "Catalogue of the Lepidopterous Insects in the British Museum," vol. i., page 4, note 6, plate 2, fig. 3 (is *Poseidon* var).

1852. **PAPILIO (ORNITHOPTERA,** *Subgenus*), G. R. Gray, "Catalogue of Lepidopterous Insects in the British Museum."

1852. **P. Tithonus,** Gray, "Catalogue of the Lepidopterous Insects in the British Museum," vol. i., page 5, note 8 (the ♂).

1852. **Papilio Richmondia,** Gray, "Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 2, note 2, figs. 1, 2.

1852. **Papilio Priamus,** Gray, "Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 2, note 1 (the two sexes).

1855. **Ornithoptera Brookeana,** Wallace, "Proceedings of the London Entomological Society," series 2, vol. iii, page 104 (the ♂ only known).

1855. **O. Brookeana,** W. C. Hewitson, "Exotic Butterflies, new or insufficiently figured," vol. i., plate 1, fig. 1 (the ♂ only known).

1855. **Papilio Antimachus,** Chenu, "Encyclopédie d'Histoire Naturélle, Papillons Diurnes," vol. i., page 38, plate 15, (the ♂).

1856. **P. Tithonus,** Gray, "List of Lepidopterous Insects in British Museum," vol. i., page 3, note 8 (the ♂).

1856. **ORNITHOPTERA** *(Genus),* Chenu, "Encyclopédie d'Histoire Naturélle," Papillons Diurnes, vol. i., page 33.

1856. **O. Priamus,** Gray, "List of Lepidopterous Insects in the British Museum," vol. i., page 3, note 5 (the ♂ of *Poseidon*).

1856. **O. Victoriæ,** Gray, "Proceedings of the Zoological Society, London," page 7, plate 39 (the ♀).

1856. **Papilio Amphrysus,** Gray, "List of Lepidopterous Insects in the British Museum," vol. i., page 6, note 18 (the ♂).

1856. **Ornithoptera Pompeus,** G. R. Gray, "List of Lepidopterous Insects in the British Museum" (the ♂ and ♀ of *Cerberus*).

1856. **O. Boisduvali,** Montrouzier, "Annales Société Physiologie Naturélle de Lyon," page 393 (a var. of *Poseidon* ♂ and ♀).

1856. **O. Darsius,** Gray, "List of Insects in the British Museum," vol. i., page 4, note 13 (Both sexes).

1856. **O. Priamus,** Chenu, "Encyclopédie d'Histoire Naturélle, Papillons Diurnes," vol. i., page 3, fig. 108, by Lucas (the ♂).

1856. **Ornithoptera Urvilliana,** Gray, "List of Lepidopterous Insects in the British Museum," vol. i., page 3, note 7 (the ♂); also Papilio Poseidon, vol. i., page 3, note 5 (the ♂); also P. Nephereus, vol. i, page 6, note 17 (the two sexes of *Rhadamantus*); also P. Amphrysus, vol. i., page 6, note 18 (the ♂).

1856. **O. Rhadamanthus,** Gray, Catalogue of Lepidopterous Insects in the British Museum," vol. i., page 5, note 16 (the ♂ and ♀ of *Æacus*).

1857. **O. Richmondia,** Horsfield and Moore, "Catalogue of Lepidopterous Insects in the East India Company's Museum," vol. i., page 86, note 175.

1857. **O. Amphrysius,** the same work, vol. i., page 87, note 177 (the two sexes of *Amphrysus*).

1857. **O. Æacus,** Felder, "Reise der Osterreichischen Fregatte Novara, *Z*oologischen Theil" (voyage of the Austrian Frigate Novara; Zoological part), vol. i.

1857. **O. Boisduvali,** Montrouzier, "Essai Fauné l'Isle Woodlark" the Animal Life of Woodlark Island), page 116 (the two sexes).

1857. **O. d'Urvilliana,** Chenu, "Encyclopédie d Histoire Naturélle, vol. i., page 34.

1857. **O. Pompeus,** Horsfield and Moore, "Catalogue of the Lepidopterous Insects in the Museum of the East India Company," vol. i., page 87, note 177 (both sexes).

1857. **O. Darsius,** Horsfield and Moore," Catalogue of the Lepidopterous Insects in the British Museum of the East India Company, vol. i., page 87, note 176, plate 2, figs. 2, 2a (the larva and pupa, also ♂ and ♀).

1857. **O. Rhadamanthus,** Horsfield and Moore, "Catalogue of the Lepidopterous Insects in the East India Museum," vol. i., page 88, note 178 (the two sexes of Æacus).

1859. **O. Crœsus,** Wallace, "Proceedings of the Entomological Society of London," series ii., vol. v., page 70 (the ♂ of the species).

1859. **O. Crœsus,** Gray, "Proceedings of the Zoological Society of London," for 1859, page 424, plates 68, 69.

1859. **O. Crœsus,** Felder, "Wien Entomologische Monatschrift," Vienna Entomological Monthly Journal, vol. iii., page 390, note 31, plate 6, fig. 1.

1859. **O. Archideus,** Felder, "Wien Entomologische Monatschrift," vol. iii., page 264, note 12 (the ♂ of *Poseidon*, var. *Archideus).*

1859. **O. Aruana,** Felder, "Wien Entomologische Monatschrift," page 391, note 32, (the species *Aruana*).

1859. **O. Haliphron,** Felder, "Lepidopterologische Fragmente," page 37, plate 2, figs. 2, 3 (the two sexes).

1859. **O. Aruana,** Felder, "Lepidopterologische Fragmente," page 24 (the species *Aruana*).

1860. **O. Poseidon,** Vollenhoven, "Tijdschrift voor Entomologische," (the Journal for Entomology), vol. iii., page 70, note 2, and page 89 (the two sexes).

1860. **O. Tithonus,** Vollenhoven, "Tijdschrift voor Entomologische," vol. iii., p. 71, note 3. (the ♂).

1860. **O. Amphrysius,** Vollenhoven, "Tijdschrift voor Entomologische," vol. iii., page 71, note 8 (the two sexes of *Amphrysus*).

1860. **Papilia Trogon,** Vollenhoven, "Tijdschrift voor Entomologische," vol. iii., page 69, plate 6 (the ♂).

1860. **Ornithoptera Haliphron,** Felder, "Wien Entomologische Monatschrift," vol. iv., page 98, note 52, plate 2, figs. 2a, 2b (the two sexes).

1860. **O. Helena,** Wallace and Felder, "Proceedings of the Entomological Society of London," vol. 5, page 23 (the two sexes).

1860. **O. Darsius,** Felder, "Wien Entomologische Monatschrift," vol. iv., page 97 (the two sexes).

1862. **Papilio Zalmoxis,** Hewitson, "Illustrations of New species of Exotic Butterflies," vol. iii., page 6, plate 1, fig. 18 (the ♂).

1864. **ATROPHANEURA,** Reakirt, "Proceedings of the Entomological Society of Philadelphia," a *Genus* proposed for a species of Papilio intermediate between Papilio and Ornithoptera, possessing the large anal valves of the latter; vol. iii., pages 446-7.

1864. **PACHLIOPTERA** (part) *Genus*, Reakirt, "Proceedings of the Entomological Society of Philadelphia," vol. iii., page 504.

1864. **Papilio Euphorion,** Felder," Verhandeling Zoologische bei Geschiche Wien, page 290, note 10 (is the ♀ of the species called *Cassandra.*

1864. **P. Richmondia,** Felder, the same work, page 290, note 9, and page 332, note 8.

1864. **P. Amphrysus,** Felder, "Verhandeling Zoologische bei Geschichte Wein," page 291, note 34 (the ♂ and ♀).

1864. **Papilio Pompeus,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 291, note 28 (the 2 sexes of *Cerberus*).
1864. **P. Pronomus,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 290, note 11 (the two sexes of *Poseidon*).
1864. **P. Tithonus,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 290, note 6, and page 331, note 4 (the ♂).
1864. **P. Hephæstus,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 291, note 29.
1864. **Ornithoptera Darsius,** Felder, Verhandeling Zoologische bei Geschichte Wien, page 291, note 24 (the two sexes).
1864. **Ornithoptera Rhadamanthus,** Reakirt, "Proceedings of the Entomological Society of Philadelphia, page 444, note 1 (the sexes of *Æacus*).
1864. **Papilio Triton,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 290, note 16; also page 332, note 12 (a ♂ var. of *Poseidon*).
1864. **P. Haliphron,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 291, note 25, and page 334, note 20 (the two sexes).
1864. **Papilio Cerberus,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 291, note 31.
1864. **P. Magellanus,** Felder, "Verhandeling Zoologische bei Geschichte," page 291, page 27.
1864. **Ornithoptera Priamus,** Felder, "Verhandeling Zoologische-Botanisch Geschichte Wien, vol. xiv., page 290, note 8; also page 332, plate 7. (This is the ♂ of the var. *Oceanus*).
1864. **Papilio Poseidon,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 290, note 17 (the two sexes), and page 333, note 13 (the ♂).
1864. **P. Oceanus,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 290, note 13; and page 332, note 10. (=*Boisduvali*,= *Poseidon* variety).
1864. **P. Helena,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 291, note 22 (the two sexes).
1865. **Ornithoptera Crœsus** ("local form *a*") Wallace, "Transactions Linnæan Society," vol. xxv., page 37, note 3.
1865. **Papilio Lydius,** Felder, "Reise Novara, Lepidoptera," vol. i., page 9, note 5 (plate 3, figs. *a*, *b*, date 1865).
1865. **Ornithoptera Crœsus,** Koch, "Indo-Australian Lepidopterous Fauna," page 38 (the two sexes).
1865. **O. Pompeus,** F. Moore, "Proceedings of the Zoological Society of London," page 756 (the two sexes of *Cerberus*).
1865. **Papilio Aruanus,** Felder, "Reise Novara, Lepidoptera," vol. i., page 3, note 1, plate 1.
1865. **Ornithoptera Rhadamanthus,** F. Moore, "Proceedings of the Zoological Society of London," page 755 (the two sexes of *Æacus*).
1865. **O. Pompeus,** Moore, "Proceedings of the Zoological Society of London, 'List of the Lepidoptera of Bengal,'" page 756. (This is *Cerberus*).
1865. **O. Priamus,** Koch, "Indo-Australian Lepidopterous Fauna," page 35 (♂ and ♀ of the species).
1865. **O. Pompeus,** Wallace, "Transactions of the Linnæan Society, vol. xxv., page 9, note 9 (the two sexes).
1765. **O. Pegasus,** Felder, "Reise Novara," Lepidoptera, vol. i., page 6, note 4, plate 2, a, b (the two sexes of species).
1865. **O. Priamus,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 35 (the ♂).
1865. **O. Aruana,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 36.
1865. **O. Leda,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 39, note 8 (is *Hephæstus*, ♂ ♀).
1865. **O. Pronomus,** Koch, Indo-Australian Lepidopterous Fauna, page 37 (the sexes of *Poseidon*).
1895. **O. Helena,** var. *Papuensis*, Wallace, "Transactions of the Linnæan Society," vol. xxv., page 38, 39 (the ♀).
1865. **O. Amphrysus,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 38 (the two sexes).
1865. **Papilio Hephæstus,** Felder, Reise Fregatte Novara" (voyage of the Frigate Novara), Lepidoptera, vol. i., page 16, note 8 (the two sexes).
1865. **P. Cerberus,** Felder, "Reise Novara, Lepidoptera," vol. i., page 19, note 10 (the two sexes).
1865. **P. Magellanus,** Felder, "Reise Novara, Lepidoptera," vol. i., page 14, note 7, plate 5, fig. *a* (♂), *b* (♀).
1865. **Ornithoptera Richmondia,** Koch, "Indo-Australian Lepidopterous Fauna, page 36, note 2.
1865. **O. Priamus,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 35 (the ♂).
1865. **Papilio Lydius,** Felder, "Reise Novara, Lepidoptera," vol. i., page 9, note 5, plate 3, figs. a, b. (Date of the two figs. is 1864).
1865. **O. Æacus,** Moore, "Proceedings of the Zoological Society of London," page 755 (the two sexes).

1866. **Ornithoptera Archideus,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 32 (a var. of *Poseidon*).

1866. **O. Pronomus,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 32 (var of *Poseidon*); also *O. Poseidon* in the same vol., page 35, is the type form of *Poseidon*.

1866. **ORNITHOPTERA** (*Genus*), A. R. Wallace, "Transactions of the Linnæan Society, vol. xxv., page 32.

1866. **O. Euphorion,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 32 (Euphorion is the proper specific name of *Cassandra*, but the variety *Euphorion* of *O. Poseidon* is meant here).

1866. **O. Cassandra,** Scott, "Transactions of the Entomological Society of New South Wales," vol. i., page 131, plate 10.

1866. **O. Brookeana,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 40 (the ♂ only).

1866. **O. Haliphron,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 40, note 14.

1866. **O. Pompeus,** Vollenhoven, "Tijdschrift voor Entomologische," vol. iii., page 71, note 7 (the two sexes). (The Java examples are *Pompeus*, but the others *Cerberus*). The type form of *Pompeus* only occurs in Java; the Indian species is rightly named *Cerberus*; and examples from the Andamans and other localities are only local varieties of *Cerberus*.

1866. **O. Pompeus,** de Nicéville, "Journal of the Asiatic Society of Bengal," page 373, note 171 (the two sexes of *Cerberus*).

1866. **O. Magellanus,** Wallace, "Transactions of the Linnæan Society," vol. xxv., page 41.

1869. **Papilio Helena,** Butler, "Catalogue of Diurnal Lepidoptera described by Fabricius," page 234, note 3 (the two sexes).

1869. **P. Amphrysus,** Butler, "Catalogue of Diurnal Lepidoptera described by Fabricius, page 235. note 5 (the two sexes of the species).

1869. **Ornithoptera Priamus,** Butler, "Catalogue of Diurnal Lepidoptera described by Fabricius," page 234, note 1 (the sexes of the species).

1869. **O. Cassandra,** Scott, "Transactions of the Entomological Society, New South Wales," vol. ii., page 49, also page 517. (Euphorion should be the true specific name).

1869. **Papilio Miranda,** Butler, "Lepidoptera Exotica," vol. i., page 3, plate 1 (the ♂).

1869. **P. Amphrysus,** Felder, "Verhandeling Zoologische bei Geschichte Wien," page 291, note 34 (the two sexes).

1869. **P. Pompeus,** Butler, Catalogue of Insects described by Fabricius, page 235, note 4 (the two sexes of *Cerberus*).

1869. **Ornithoptera Brookeana,** Cutter, "Proceedings of the Entomological Society of London," page 21 (the ♀).

1870. **O. Priamus,** W. F. Kirby, "Notes on the Butterflies described by Linnæus, in the Proceedings of the Entomological Society of London," page 134.

1873. **Papilio Cassandra,** Butler, in Brenchley's "Cruise of the Curacoa," page 474, plate 50 (is the Australian *Euphorion*, but not the var. of *Poseidon*.

1873. **Ornithoptera Miranda,** Druce, "Proceedings of the Zoological Society of London," page 356, note 1.

1873. **O. Amphrysus,** Druce, "Proceedings of the Zoological Society of London, page 356, note 2 (the two sexes.

1874. **O. Tithonus,** Butler, "Lepidoptera of the South Sea Islands; in the Proceedings of the Zoological Society," page 289 (the ♂.)

1874. **O. Rhadamanthus,** Druce, "Proceedings of the Zoological Society of London," page 108, note 1 (the ♂ and ♀ of *Œacus*).

1874. **O. Boisduvali,** Butler, "Proceedings of the Zoological Society of London," page 288, note 85 (var. of *Poseidon* ♂ ♀).

1874. **O. Urvilliana,** Orbigny, "Dictionaire d'histoire Naturélle," Atlas Zoologique, vol. ii., Lepidoptéres, plate 1 (the ♂).

1874. **O. Victoriæ,** Butler, "Lepidoptera of the South Sea Islands, in the Proceedings of the Zoological Society," page 284.

1874. **Papilio Pompeus,** var. *Hephæstus*, Hopffer, "Stett in Entomologische Zeitschrift," page 18, note 2 (the two sexes of *Hephæstus*).

1875. **Ornithoptera Ruficollis,** var. *a*, Butler, "Transactions of the Linnæan Society," Series II., Zoology," vol. i., page 552, note 1 (the ♂).

1875. **O. Rhadamanthus,** var. *Thomsoni* Bates; Thomson's "Straits of Malacca," page 546 (the ♂ of *Œacus*; the true locality, however, is Siam).

1876. **Papilio Zalmoxis,** A. R. Wallace. "Address delivered to the Biological Section of the British Association, Glasgow," page 3.

1877. **Ornithoptera Rhadamanthus,** Distant, "Rhopalocera Malayana,' pages 326-7, two figs. of ♀ in the text; and plate 27a, fig. 5, the ♂.

1877. **O. Hephæstus,** Distant, "Rhopalocera Malayana, page 328, plate 27, figs. 3 ♂, 4 ♀.

1877. **O. Heliconoides,** Moore, "Proceedings of the Zoological Society of London," page 592 (is *Cerberus*) ♂ and ♀.

1877. **O. Priamus,** Kirsch, "Mitthéilungen Museum, Dresden" (Information concerning the Dresden Museum), vol. i., page 110, sub-note 1 (the two sexes).

1877. **O. Pegasus,** vars. Th. Kirsch "Beitrag nur Kenntniss der Lepidopteren-Fauna von Neu Guinea," in "Mitthéilungen aus dem K. Zoologischen Museum zu Dresden," contribution to the knowledge of the Lepidopterous Fauna of New Guinea, in 'Information concerning the K. Zoological Museum of Dresden,' part 2, page 108, plate 5, fig. 1 ♀, fig. 2 ♀ (possibly vars. of *Aruana*).

1877. **O. Urvilliana,** Salvin and Godman, "Proceedings of the Zoological Society of London, page 147 (the two sexes).

1877. **O. Uruana,** Salvin and Godman, the same work, page 147.

1878. **Papilio Haliphron,** Piepers and Snellen, "Tijdschrift voor Entomologische," vol. xxi., page 37, note 147 (the two sexes).

1878. **O. Priamus,** v. *Richmondia*, Semper, "Journaal Museum Godeffroy" (Journal of the Godeffroy Museum) *Euphorion*, Heft (or number) 14, page 41, subnote 128.

1878. **O. Pronomus,** Semper, the same work, Heft 14, page 41, subnote 128 (the ♂ and ♀ of *Richmondia=Euphorion*).

1878. **O. Pompeus,** var. *Hephæstus*, Snellen, "Tijdschrift voor Entomology," vol. xxi., page 37, note 146 (is *Hephæstus*).

1878. **O. Priamus,** var. *Pronomus*, Semper, "Journaal Museum Godeffroy, Heft 14, subnote 128 (the two sexes of *Poseidon*).

1879. **O. Amphrysius,** Oberthür, "Études d'Entomologie," vol. iv., page 30, note 9 (is *Ruficollis* ♂ ♀).

1879. **O. Amphrysius,** var. *Cuneifera*, Oberthür, "Études d'Entomologie," vol. iv., page 110, subnote 9 (the ♂).

1879. **O. Miranda,** Oberthür, "Études d'Entomologie," vol. iv., page 110, note 9 bis.

1879. **O. Criton,** Oberthür, "Études d'Entomologie," vol. iv., page 31, note 10 (the two sexes).

1879. **O. Helena,** Oberthür, "Études d'Entomologie," vol. iv., page 30, note 6 (the two sexes).

1879. **O. Jupiter,** var., Oberthür, "Études d'Entomologie," vol. iv., page 31, note 11, plate 1, fig. 1 (is *Helena* ♀ var. with the posterior wings devoid of subdiscal black spots).

1879. **O. Heliacon,** aberration *rutilans*, Oberthür, "Études d'Entomologie," vol. iv. page 32, subnote 13 (the two sexes of a var. of *Helena*).

1879. **O. Phadamantus,** Oberthür, "Études d'Entomologie," vol. iv., page 32, note 16 (the two sexes of *Rhadamanthus*).

1879. **O. Papuanus**, Oberthür, "Études d'Entomologie," vol. iv., page 31, subnote 10 (a ♀ var. of *Helena*).

1879. **O. Jupiter,** var., Oberthür, "Études d'Entomologie," vol. iv., page 31, note 11, plate 1, fig. 1 (a ♀ var. of *Helena*).

1879. **O. Heliacon,** ab. *rutilans*, Oberthür, "Études d'Entomologie," vol. iv., page 32, subnote 13 (the two sexes of *Helena* var.)

1879. **O. Helena,** Oberthür, "Études d'Entomologie," vol. iv., page 30, note 6 (the two sexes).

1879. **O. Darsius,** Oberthür, "Études d'Entomologie," vol. iv., page 30, note 8 (the two sexes).

1879. **O. Haliphron,** Oberthür, the same work, vol. iv., page 30, note 7, and page 110, note 7 (the two sexes).

1879. **O. Haliphron,** var. *pallens*, Oberthür, the same work, vol. iv., page 110, subnote 7 (the ♀ of a light form of the species—*baermanni* also).

1879. **O. Amphrisius,** var. *flavicollis*, Oberthür, the same work, vol. iv., page 30, subnote 9.

1879. **O. Priamus,** var. *Richmondia*, Oberthür, the same work, vol. iv. page 29, subnote 1 (equals *Euphorion*).

1879. **O. Hephæstus,** Oberthür, the same work, vol. iv., page 31, note 12 (the two sexes).

1879. **O. Minos,** Oberthür, "Études d'Entomologie," vol. iv., page 32, note 14 (the two sexes).

1879. **O. Priamus,** var. *Arruanus*, Oberthür, "Études d'Entomologie," vol. iv., page 27, subnote 1 (the two sexes of *Poscidon*).

1879. **O. Pompeus,** Oberthür, the same work, vol. iv., page 32.

1879. **O. Magellanus,** Oberthür, the same work, vol. iv. page 32.

1879. **Ornithoptera Priamus,** Oberthür, "Études d'Entomologie," vol. iv., page 27, note 1 (the two sexes).

1880. **DRURYA,** *Genus* (described as a section of Papilio), Aurivillius, "Fjärilar från Gaboon" butterflies from the Gaboon, in the "Ent. Tidskrift, page 44, Stockholm. (Entomological Tidings).

1880. **O. Priamus,** var. *Aruana*, Oberthür, "Études d'Entomologie," vol. iv., page 27, subnote 1 (the two sexes of *Poseidon*), also O. Priamus,, Arruanus, Oberthür, "Annales Musée Civique Genova; vol. xv., page 46, fig., note 1.

1880. **O. Criton,** "Annales Musée Civique Genova," vol. xv., page 468, note 3 (the two sexes).

1880. **O. Heliconoides,** Wood Mason and Nicéville, "Journal of the Asiatic Society of Bengal," page 237, note 65 (the Andaman forms of *Cerberus* ♂ ♀).

1880. **Ornithoptera Brookeana,** Snellen, "Lep. v. Midden-Sumatra," the Lepidoptera of Central Sumatra, page 24, note 1.

1881. **O. Brookeana,** Distant, "Entomological Monthly Magazine," page 237.

1881. **O. Pompeus,** Wood Mason, "Journal of the Asiatic Society of Bengal," page 252, note 94 (the two sexes of *Cerberus*).

1881. **O. Pompeus,** var. Minos, Wood Mason, the same work, page 86 (the two sexes of *Minos*).

1881. **O. Darsius,** Moore, "Lepidoptera of Ceylon," vol. i., page 155, plate 55, figs. 1, 1a, 1b (the ♂ and ♀), also the larva and pupa.

1881. **O. Brookeana,** P. H. Gosse, "Entomologist," vol. vii., page 156.

1881. **O. Heliconoides,** Wood Mason, "Journal of the Asiatic Society of Bengal," page 252, note 94 (the ♂ ♀ of the Andaman Island form of *Cerberus*).

1882. **Papilio Helena,** Aurivillius, "Kongl. sv. vet. ak. Handl." vol. xix. (5) page 22, note 18 (the ♂).

1882. **Ornithoptera Rhadamanthus,** Dewitz, "Nov. Act Kais Leop. ac Nat. vol. xiv., L., page 262, note 2, plate 2, figs. 7, 7a, 7b (the two sexes of *Rhadamantus*).

1882. **O. Priamus,** Aurivillius, "Kongl sv. vet. ak. Handl. vol. xix (5), page 8, note 1 (♂); also page 19, note 14 (♀). (Recensio Mus. Ulr.)

1883. **O. Aruana,** P. H. Gosse, "Clasping organs in certain Lepidoptera," Trans. Linn. Soc., vol. ii., 2nd series, page 282, plate 26, figs. 1-3.

1884. Scent Glands of Ornithoptera (Duftapparate Indo-Australischer Schmetterlinge) Erich Haase, "Correspondenz-blatt des Entomologishen Vereins" in the "Iris." The species treated of are *Priamus*, page 93, plate 3, fig. 1; *Pompeus*, page 93; *Brookeana*, plate 3, fig. 2 and *Tithonus*, page 94; also Ornithoptera, page 281; *Helena*, page 282; *Archideus*, page 282; *Brookeana*, page 283.

1884. **Ornithoptera Haliphron,** var. *Bauermanni*, Röbur, "Iris," Correspondenzbatt, page 19 (the species and larva).

1884. **O. Priamus,** Pagenstecher, "Jahrbüch Nassauischen Verhandeling Naturgeschichte," page 201 (the two sexes).

1884. **O. Priamus,** var. *Urvilliana*, "Staudinger, "Staudinger und Schatz, Exotische Schmetterlinge," vol. i., page 5, plate 2 (the ♂).

1884. **O. Hippolytus,** Pagenstecher, "Jahrbüch Nassauischen Verhandeling Naturgeschichte," page 201 (the two sexes).

1884. **O. Cerberus,** Staudinger and Schatz, "Exotische Schmetterlinge, vol. i., page 4, plate 2 (the ♂ ♀ of *Cerberus*).

1884. **O. Minos,** Staudinger and Schatz, the same work, vol. i., page 5 (the two sexes).

1884. **O. Rhadamanthus,** var. *Amphrisius*, Staudinger and Schatz, the same work, vol. i., page 4 (the ♂ of *Æacus*).

1884. **O. Amphrysus,** Staudinger and Schatz, the same work, vol. i., page 5 (the two sexes of *Amphrysus*).

1884. **O. Criton,** Staudinger and Schatz, the same work, vol. i., page 5 (the two sexes).

1884. **O. Criton,** Butler, "Annals and Magazine of Natural History" (5), vol. xiii., page 196, note 42 (the two sexes).

1884. **O. Haliphron,** Staudinger and Schatz, "Exotische Schmetterlinge," vol. i., page 5, plate 2 (the ♂).

1884. **O. Rhadamanthus,** Staudinger and Schatz, the same work, vol. i., page 4, plate 1 (the two sexes of *Rhadamantus*.

1884. **O. Amphrysus,** Kheil, "Rhopalocera of Nias," page 34, note 136 (the ♂ of *Ruficollis*).

1884. **O. Priamus** var. Richmondia, Staudinger and Schatz, "Exotische Schmetterlinge," vol. i., page 3, plate 1 (the two sexes of *Euphorion*).

1884. **O. Heliconoides,** Staudinger and Schatz, the same work, vol. i., page 5 (the ♂ of *Cerberus*).

1885. **O. Tithonus,** Oberthür, "Annales de la Société Entomologique de France," Bulletin, page cxxii (the ♀).

1885. **Ornithoptera Ruficollis,** Distant, "Rhopalocera Malayana," page 328, note 3, plate 27, fig. 1 (the ♂); also page 329, fig. 107 in text (the ♀), plate 27a, fig. 1 (♀ var).
1885. **O. Riedeli,** Kirsch, "Proceedings of the Zoological Society," page 275, plate 19, fig, 12.
1885. **O. Amphrysus,** Kheil, "Rhopalocera of Nias," pp. 36, 37.
1885. **O. Helena,** v. *leda*, Staudinger, "Deutsch Zeitschrift, Lep." page 74, plate A.
1885. **O. Olympia,** Honrath, "Ent. Nachrichten," vol. xvii., page 241 (or 291 ?).
1885. **O. Haliphron** v. *bauermanni*, O. Aruana, and O. Crœsus, Ribbe, Deutsche. z. Lep. vol. iii., Larva and Pupa of these; pp. 37, 38, 40, plate 1, figs. 1-3.
1885. **O. Andromache,** Staudinger, "Deutsch Ent. Zeitschrift," vol. v., page 393.
1885. **O. Ruficollis,** Distant, "Rhopalocera Malayana," page 328, note 3, plate 27, fig. 1 (♂); also page 329, fig. 107 ♀; and plate 27a, fig. 1 (♀ var).
1885. **O. Riedeli.** "Proceedings of the Zoological Society," page 275, note 1, plate 1 (♂), 2 (♀).
1885. **O. Hephæstus,** Distant, "Rhopalocera Malayana," page 328, note 2, plate 27, fig. 2 (♀); abenation 3 (♂) 4 (♀); (the two sexes of *Cerberus*).
1885. **O. Hephæstus,** Weymer, "Stettin Entomologische Zeitschrift, page 270 (the two sexes of *Cerberus*).
1885. **O. Tithonus,** "Annales de la Société Entomologique de France, Bulletin, Oberthür," page 122 (the ♀).
1885. **O. Brookeana,** Distant, "Rhopalocera Malayana, vol. i., page 330, plate 27a, fig. 4 (♀); and plate 27b., fig. 1, ♂ in vol. ii.
1886. **O. Minos,** Oberthür, "Études d'Entomologie," part xi., page 14 (the two sexes of *Æacus*).
1886. **O. Priamus,** Ribbe, "Iris," page 77, note 1 (the two sexes).
1886. **O. Pompeus,** var. *Heliaconoides* "De Nicéville," Journal of the Asiatic Society," page 373, note 171 (the two sexes of *Æacus*).
1886. **O. Trojana,** Honrath, "Berliner Entomologische Zeitschrift," vol. xxxiii., page 3 (the ♂).
1886. **O. Priamus,** Honrath, "Berliner Entomologische Zeitschrift, page 11 (the two sexes).

1817. **ORNITHOPTERA Sub genus,** Distant, "Rhopalocera Malayana," vol. i. (text), page 32.

1887. **O. Minos,** Aitken, "Journal of the Bombay Natural History Society, page 35, note 73 (the two sexes).
1887. **O. Miranda,** Distant and Pryer, "Annals and Magazine of Natural History vol. xix., page 272, 5th series, note 165 (the two sexes).
1887. **O. Victoriæ**, var. *Reginæ*, Grose-Smith, "Annals and Magazine of Natural History" (5th Ser.), vol. xix., page 445, the ♂ of *Reginæ*).
1888 **Papilio Zalmoxis,** Staudinger and Schatz," "Exotische Schmetterlinge," vol. ii., plate 7 (the ♂).
1888. **Ornithoptera Helena,** Staudinger and Schatz, "Exotische Schmetterlinge," vol. i., plate 5 (the two sexes).
1888. **O. Priamus,** Fickert, "Ueber die Zeichnungsverhältnisse der gattung Ornithoptera, page 702.
1888. **Drurya Antimachus,** Staudinger and Schatz, "Exotische Schmetterlinge," plate xiii.
1888. **Ornithoptera Tithonus,** Oberthür, "Études de Entomologie," 12th livr., page 1, note 1, plate 8, fig. 10 (the ♀).
1888. **O. Aruana,** var. *Goliath*, Oberthür, "Études d'Entomologie." Livraison xiii, page 2 (the ♀ of *Schoenbergia Goliath*).
1888. **O. Plateni,** Staudinger, "Correspondenz-Blatt des Entomologischen Vereins, 'Iris' zu Dresden," page 274 (the two sexes).
1888. **O. Pronomus,** Mathew, "Transactions of the Entomological Society," page 168; its life history (is *Poseidon*).
1888. **O. Urvilliana,** Mathew, the same work, page 169, plate 6, fig. 1 (the two sexes).
1888. **O. Durvilliana,** Woodford, "Proceedings of the Zoological Society," page (the two sexes). Durvilliana or D'Urvilliana are incorrect, the latter the least so.
1888. **O. Priamus,** var. *Lydius*, Staudinger and Schatz, Exotische Schmetterlinge, vol. i., page 4, plate 4.
1888. **O. Pompeus,** Watson, "Journal of the Bombay Natural History Society," page 26 (the two sexes of *Cerberus*.
1888. **O. Pompeus,** Elwes, "Transactions of the Entomological Society of London," page 422, note 394 (the two sexes of *Cerberus*).
1888. **O. Rhadamanthus,** Elwes, the same work, page 422, note 343 (the ♂ ♀ of *Æacus*).
1888. **Papilio (O.) Minos,** Hampson, "Journal of The Asiatic Society of Bengal," page 363, note 193 (the two sexes).

1888. **Ornithoptera Helena,** Staudinger and Schatz, "Exotische Schmetterlinge," vol. i., page 5 (the two sexes).

1880. **O Staudingeri,** Röber, "Entomologische Nachrichten," Entomological Information, page 369 (the two sexes).

1888. **O. Iris,** Röber, the same work, page 369 (the two sexes).

1888. **O. Pronomus,** Mathew, "Transactions of the Entomological Society of London," page 168; deals with the life history of the species (is *Poseidon*).

1888. **O. Hippolytus,** Staudinger and Schatz, "Exotische Schmetterlinge." vol. ii., plate 2 (the ♂).

1888. **O. Ruficollis,** Fickert, "Ueber die Zeichnungsverhältnisse der Gattung Ornithoptera," in the "Zoologischen Jahrbüchen." Concerning the proportionate delineation of the species of Ornithoptera, from the Zoological Yearbook of Geography and Biology (deals also with the classification), page 739. Fickert also treats of the following species, *Priamus*, page 698, plate 20, figs. 1 ♂, 2 ♀; *Cassandra*, Scott, page 701; *Richmondia*, Gray, page 702; *Priamus*, var. *Euphorion*, Gray, page 703; *Priamus*, var. Aruana, Felder, page 704, plate 20, fig. 3 ♂. 4 ♀; *Priamus*, var. Pronomus, page 706; *Priamus*, var. Cronius, Felder, page 706; *Priamus*, var. *Pegasus*, Felder, page 707; *Priamus*, var. Poseidon, Doubleday, page 709; Priamus, var. Archideus, Gray, page 709; *Priamus*, var. *Crœsus*, Wallace, page 711; *Priamus*, var. *Urvilleana*, page 712; *O. Tithonus*, page 720, plate 20, fig. 6 ♂, fig. plate 21, fig. 1, ♀; *Victoriæ*, page 722, plate 21, fig. 2 ♂, fig. 3 ♀; *Reginæ*, page 723, plate 21, fig. 4, ♀; *Pompeus*, page 727, plate 21, fig. 5 ♂, fig. 6 ♀; *Pompeus* var. *Hephæstus*, Felder, page 729; *Pompeus* var. *Pluto*, Felder, page 730; *Pompeus*, var. *Minos*, Cramer, page 730; *Cerberus*, page 732; *Rhadamanthus*, page 733, *Haliphron*, page 734; *Helena*, page 735; *Darsius*, page 736; *Criton*, page 737, plate 21, fig. 7 ♂; *Amphrysus*, page 739; *Magellanus*, page 740; *Jupiter*, page 741; *Hppolytus*, page 741; *Bauermanni*, page 743; *Brookeana*, page 749, plate 21, fig. 8; *Zalmoxis*, page 754; *Plateni*, page 762.

1889. **ORNITHOPTERA,** *Genus*, Fickert, characters noticed in the same work.

1889. **DRURYA** *Genus*, Fickert (characters noticed), "Zoologischen Jahrbüch, Abtheilen fur Systematisch," vol. iv., page 692 (the same work).

1889. **O. Brookeana,** var. *Trojana*, Staudinger, "Lepidoptera der Insel Palawan," in the "Deutsch Entomologische Zeitschrift, vol. ii., page 7, and page 163.

1889. **O. Trojanus,** Staudinger, "Iris," vol. ii., page 4 (the ♂).

1889. **O. Priamus,** var. *Poseidon*, Caprinnier, "Annale Entomologie Belgique," vol. xxx., page 1.

1889. **O. Plateni,** Staudinger, "Deutsch Zeitschrift Lepidoptera" page 3, descriptive note.

1889. **O. Brookeana,** var. *Trojana*, Staudinger, "Lepidopteren der Insel Palawan, Deutsch Entomologische Zeitschrift," Lepidoptera of the Island of Palawan, in the Entomological Journal, vol. 2, page 7 (the ♂), also page 163.

1889. **Papilio (Ornithoptera) Ritsemæ,** Snellen, "Notes on the Leyden Museum," vol. xi., page 153 (is *Cuneifera*, of Oberthür, the two sexes).

1889. **Ornithoptera Nephereus,** Staudinger, the "Iris," vol. ii., page 4 (the sexes of *Rhadamantus*)

1889. **O. Brookeana,** ♀ var. *Eleanor*, Dr. F. A. Walker, "Transactions of the Entomogical Society," page 75.

1889. **O. Priamus,** Sidney Olliff, "Australian Butterflies," page 38. 2 figs. (one is the ♂; the other is probably the ♀ of *Cassandra* (Euphorion). He also mentions *Cassandra*, page 39.

1889. **O. Aruana,** Dr. F. A. Walker, "Paper on Oriental Entomology," part ii., page 11.

1889. **O. Richmondia,** Rippon, the present work, vol. i., page 9, plate 4.

1889. **O. (Priamoptera)** Crœsus, Rippon, the present work, page 33, plate 12.

1889. **TROGONOPTERA,** *Genus*, Rippon, the present work and vol., page 1.

1889. **Trogonoptera Bookeana,** Rippon, see page 2 of this vol. and plate 26 (the 2 sexes, and var. *Eleanor*, Walker).

1889. **POMPEOPTERA,** *Genus*, see page 7 of the present work and vol.

1889. **Pompeoptera Hippolytus,** ibid, see page 9, plate 29.

1890. **Ornithoptera Pompeus,** var. *Holzi*, Pagenstacher, "Jahrbüch Nassauischen Verhandeln Naturgechichte,' page 103, note 3 (a var. of *Helena*).

1885. **Papilio Antimachus,** W. F. Kirby, "Text Book of Entomology," page 160, plate 53 (from Chenu), 1st edition (the ♂).
1890. **Ornithoptera Helena,** Ribbe, "Iris," vol. ii., page 207, note 3 (aberration of the ♀); ibid, l.c., vol. iii., page 41 (Larva and Pupa).
1890. **Pompeoptera Plateni,** in the present work and vol., pages 65, 66, plate 62 (both sexes).
1890. **Ornithoptera Hephæstus,** Holland, "Proceedings of the Boston Natural History Society," vol. xxiv., page 77, note 124 (the two sexes).
1890. **O. Helena,** Ribbe, "Iris" vol. iii., page 41 (the ♂ ♀ the two sexes).
1890. **O. Haliphron,** Ribbe, the same work, vol. iii., page 39 the larva and pupa).
1890. **O. Minos,** Davidson and Aitken, "Journal of the Bombay Natural History Society," page 361, note 64 (deals with the life history of the species).
1890. **O. Pompeus,** Nicéville, "Journal of the Bombay Natural History Society," page 387, note 86, is *Cerberus*).
1890. **O. Crœsus,** Ribbe, "Iris," page 42, plate I., figs. 1-3 (its life history).
1890. **O. Hippolytus,** sub-species *Cellularis*, Rothschild, Holland, "Proceedings of the Boston Natural History Society," vol. xxv., page 125.
1890. **O. Hippolytus,** Ribbe, "Iris," vol. ii., page 207, note 2 (the two sexes of the type form).
1890. **Papilio van de Polli** (should be *Vandepolli*), Snellen, "Tijdschrift voor Entomologische," vol. xxxiii., page 22.
1890. **Ornithoptera Nereis,** Doherty, "Journal of the Asiatic Society of Bengal," vol. lx., page 30.
1890. **O. Pompeus,** Watson, "Journal of the Bombay Natural History Society," page 387, note 86 (is *Cerberus* ♂ ♀).
1890. **O. Priamus,** Ribbe, "Iris," page 207, note 1 (the two sexes).
1890. **O. Poseidon,** Ribbe, "Iris," iii., page 41 (the two sexes).
1890. **O. Priamus,** Rippon, the present work, vol. i., page 4, plate 1a (the ♂, 1b, the ♀).

1890. **ORNITHOPTERA,** *Genus*, with *Priamus* as the type, Rippon, the present work, page 1 of vol. i.

1890. **O. Cassandra,** Rippon, the present work, vol. i., page 8, plates 2a ♂, 2b ♀ (should be ♂ ♀ *Euphorion*).
1890. **Pompeoptera Plateni,** Rippon, the present work and vol., page 65, plate 62.
1891. **Ornithoptera Helena,** Rober, "Tijdschrift voor Entomologische," vol. xxxiv., page 268 (the ♂ and ♀).
1891. **O. Criton,** Ribbe, "Iris," vol. iii., page 43 (the larva and pupa).
1891. **O. Riedeli,** Röber, "Tijdschrift voor Entomologische," vol. xxxiv., page 269 (the ♂ and ♀).
1891. **O. Olympia,** Honrath, "Entomologischen Nachrichten," vol. xvii., page 241 (a local variety of *Flavicollis* from S. E. Borneo) (the ♀); also O. Flavicollis, var. Olympia, Honrath, "Berliner Entomologische Zeitschrift," vol. xxxvi., page 429, plate 15, fig. 1 (the ♀).
1891. **O. Poseidon,** var. *hecuba*, Röber, "Tijdschrift voor Entomologischen," vol. xxxiv., page 263 (the ♂).
1891. **O. Trojana,** W. Watkins, "The Entomologist," No. 339, vol. xxiv., with coloured plate.
1891. **O. Magellanus,** Semper, "Philippiner Tagfalter," page 264, note 385.
1891. **O. Trojanus,** Semper, Philippiner, Tagfalter, page 263, note 384.
1891. **O. Helena,** Röber, "Tijdschrift voor Entomologische," vol. xxxiv., page 268 (♂ and ♀, also larva and pupa).
1891. **O. Pompeus,** Pagenstecher, "Jahrbüch Nassauischen Verhandeling Naturgeschichte," var. Holzi=rutilans of Oberthür,=*Helena* var.
1891. **O. Naias,** Doherty, "Journal of the Asiatic Society of Bengal," vol. lx., page 193, note 116 (the two sexes).
1891. **O. Socrates,** Staudinger, "Iris," vol. iv., page 71 (the two sexes).
1891. **O. Rhadamanthus,** Watson, "Journal of the Asiatic Society of Bengal," page 53, note 205 (the two sexes of *Æacus*).
1891. **Papilio O. Minos,** Fergusson, "Journal of the Bombay Natural History Society," page 445, note 167 (the two sexes).
1891. **Ornithoptera Staudingeri,** Staudinger, "Iris," vol. iv., page 74 (the two sexes).
1891. **O. Plato,** Wallace, translated by Staudinger, "Isis," vol. iv., page 74 (the ♂).
1891. **O. Plato,** Röber, 'Tijdschrift voor Entomologische," vol. xxxiv., page 269 (the ♂ and ♀).
1891. **O. Staudingeri,** the same author and work, vol. xxxiv., page 263 (the two sexes).
1891. **O. Naias,** var. *Sambawama*, Doherty, "Journal of the Asiatic Society of Bengal," page 194, sub-note 116 (the two sexes); also page 193, note 116.
1891. **O. Iris,** Staudinger, "Iris," vol. iv., page 74 (the two sexes).

1890. **Ornithoptera Œacus,** Manders, "Transactions of the Entomological Society of London," page 535.
1891. **O. Iris,** Röber, "Tijdschrift voor Entomologische," page 279 (the ♂ and ♀).
1891. **O. Nephereus,** Semper, "Philippiner Tagfalter," or Philippine Day Butterflies," page 264, note 386 (the ♂ and ♀ of *Rhadamantus*).
1892. **Papilio Antimachus,** Rutherford, "Entomological Monthly Magazine," vol. xv., page 5; and "Entomological Monthly Magazine," vol. 3 (new series), page 162.
1892. **P. Antimachus,** W. F. Kirby, "Text Book of Entomology," page 160, plate 53 (copied from Chenu), 2nd edition (the ♂).
1892. **Drurya Antimachus,** Schatz, "Die Familie und Gattung der Tagfalter," pages 22 and 40, plate ii., figs. 1 a.b. (the ♂).
1892. **Papilio (Ornithoptera),** Cerberus, Ribbe, "Annales Société Entomologique Belgæ," page 123, note 1 (the two sexes).
1892. **Ornithoptera Andromache,** Staudinger, "Iris," vol. v. page 393 (the two sexes).
1892. **O. Riedeli,** Grose-Smith and Kirby, "Rhopalocera Exotica," vol. ii., Ornithoptera, page 3, plate 2, fig. 1 (♂), 2 (♀).
1892. **O. Poseidon,** Tryon, "Report on the British Administration in New Guinea," appendix, v. page 112 (the ♂ and ♀).
1862. **O. Arruana,** var. *Valentina*, Vuillot, "Bulletin Société Entomologique d'France," page 124 (dwarfed examples of *Poseidon* ♂ ♀).
1892. **Papilio Brookeana,** Snellen, "Midden-Sumatra," vol. ii., page 24, note 1.
1892. **Ornithoptera Hippolytus,** Schatz, "Die Familie und Gattungen," page 42.
1892. **O. Hippolytus,** Rothschild, "Iris," vol v., page 442.
1892. **O. Honrathiana,** Martin, "Berliner Entomologische Zeitschrift," vol. xxxvii., page 492 (the ♀ var. of *Vandepolli*).

1892. **DRURYA,** *Genus*, "Staudinger und Schatz," Exotische Schmetterlinge; die Familie und Gattung der Tagfalter," vol. ii., page 22, plate 40.

1892. **Drurya Antimachus,** Watkins, "Entomological Monthly Magazine" (a brief description of the ♀), vol. iii., New Series, page 162; and plate 5, with neuration of the anterior wing (internal nervure omitted), and figs. of ♂ and ♀ anal terminals.
1892. **Ornithoptera Zalmoxis,** Staudinger, "Iris," vol. v., page 268 (the ♀).
1892. **O. Eumæus,** Rippon, "Annals and Magazine of Natural History," page 193 (the 2 sexes), a var. of *Aruana*. which, together with a new and blue form from the Island of Oby, connects *Aruana* with *Urvilliana*.

1893. **ORNITHOPTERA** (*Genus*), Pagenstecher, "Beitrage zur Lepidopteren: Fauna des Malayischen Archipels; Jahrbüchen der Nassauischen Vereins für Naturkunde," page 83; in the same paper Pagenstecher suggests *Schoenbergia* as a subgenus.

1893. **O. Paradisea,** Staudinger, "Entomologische Nachrichten," s. 177.
1893. **O. Schoenbergi,** Pagenstecher, "Jahrbüchen der Nassauischen Vereins für Naturkunde," s. 29 pp., plate ii, note iii, the ♂; s. 83 pp., plate iv, the ♀; described on page 30, plates 2, 3, ♂; 4, ♀.
1893. **O. Socrates,** Staudinger, "Iris," vol. vi., page 83, plate 1, fig. 1 (as a local form of *Haliphron*. This is identical with *Pompeoptera Naias*.
1893. **Pompeoptera Dohertyi,** Rippon, "Annals and Magazine of Natural History," vol. ii., N. Series, page 295 (the two sexes).
1893. **P. Dohertyi,** Rippon, the present work and vol., pages 67-8, plates 63, 64 (both sexes).
1893. **Ornithoptera Honrathiana,** Martin, "Natuurkund Tijdschrift, voor Nederlandsch Indie," vol. liii., page 1 note 1.
1893 **O. Cerberus,** Swinhoe, "Transactions of the Entomological Society, London," page 311, note 372 (the two sexes).
1893. **O. Magellanus,** Haase, "Untersuch üb Mimisch," page 29 (the two sexes).

1893. **SCHOENBERGIA,** sub-genus, Pagenstecher, "Jahrbüchen der Nassauischen Vereins für Naturkunde," page 83.

1893. **Ornithoptera Paradisea,** Staudinger, "Entomogische Nachrichten, page 177.
1893. **O. Paradisea,** Pagenstecher, "Jahrbüchen der Nassauischen Vereins für Naturkunde," page 29, plate 2 and 3 (♂), page 83, plate 4 (the ♀).
1893. **O. Pegasus,** Rippon, in vol. i. of the present work, plate 5, figs. 1, 2 (♂); 3 (♂); 4, 5, (♀).
1893. **O. Æacus,** Swinhoe, "Transactions of the Entomological Society of London," page 311.
1893. **O. Æacus,** Leech, "Butterflies of China," vol. ii., page 513.
1894. **O. Æacus,** de Nicéville, "Sikkim Gazeteer," page 170.
1894. **O. Honrathiana,** Hagen, "Iris," vol. vii., page 19, note 4.
1894. **O. Vandepolli,** Frühstorfer, "Berliner Entomologische Zeitschrift, page 241, plate 17, fig. 1.
1894. **O. Helena,** var. *Thestius*, Staudinger, "Deutsche Entomologische Zeitschrift," Lepidoptera, vol. viii., page 283.
1894. **O. Pegasus,** var. Pagenstecher, "Jahrbüch Nassauischen Verhandelung Nature," page 63, note 1, plate 2 and 3, fig. 1 (the ♂ of *Poseidon*).
1894. **O. Pegasus,** Grose-Smith, "Novitates Zoologicæ," vol. i., page 331, note 1 (the two sexes).
1894. **Troides Vandepolli Honrathianus,** Hagen, "Iris," vol. vii., page 19, note 4.
1894. **Ornithoptera Amphrysus,** Hagen, "Iris," vol. vii., page 18, note 2 (the two sexes).
1894. **O. Pompeus,** var. holzi (= *rutilans* of Oberthür), Pagenstecher, "Jahrbüch Nassauischen Verhandelung Nature," page 29 (a var. of *Helena*).
1894. **O. Amphrysus,** var. *Palabuana*, Frühstorfer, "Entomologische Nachrichten," page 44.
1894. **O, Pompeus,** Nicéville, "Gazeteer of Sikkim," page 170, note 459 (the ♂ ♀ of *Cerberus*).
1894. **O. Hephæstus,** Hagen, "Iris," vol. vii., page 18, note 3 (the ♂ and ♀ of *Cerberus*).
1894. **O. Ritsemæ,** var. *Sumatranus*, Hagen, "Iris," vol. vii, page 19, note 5 (a ♂ var. of *Cuneiferæ* of Oberthür).
1894. **O. Brookeana,** Hagen, "Iris," vol. vii., page 18, note 1 (the ♀).
1894. **O. Urvilliana,** Pagenstecher, "Jahrbüch Nassauischen Verhandelung Natursgeschichte," page 67, note 3 (on variation; ♂ ♀).
1894. **O. Tithonus,** Staudinger, "Iris," vol. vi., page 355 (the two sexes).
1894. **Troides Priamus Urvilliana,** ab. loc. *bornemanni*, Pagenstecher, "Jahrbüch Nassauischen, Verhandelung Naturgeschichte, page 65, plate 3, fig. 2 (the ♂ of a green variety).
1894. **Ornithoptera Andromache,** Staudinger, "Iris," vol. vii., page 341, plate 8.

1894. **SCHOENBERGIA,** *Genus*, Rippon, the present work, vol. i., page 9.

1894. **Sch. Paradisea,** Rippon, the present work, vol. i., page 10, plate 4 (the two sexes).
1894. **Ornithoptera Goliath,** Oberthür, "Études d'Entomologie," Livraison 19, plate 4.

1894. **ÆTHEOPTERA,** *Genus*, Rippon, the present work, vol. i., page 47.

1894. **Æth. Victoriæ,** Rippon, the present work, vol. i., page 48, plates 21a, 21b, figs. 1 2, plate 22a, (the ♀).
1894. **Æth. Reginæ,** Rippon, the present work, vol. i., page 52, plate 21b, figs. 3, 4 (the ♂); plate 23a, the ♀; plate 23b, figs. 1, 2, the ♂; 3, 4, the ♀.
1894. **Ornithoptera Pegasus,** Rippon, the present work, page 15, plate 6 (the two sexes), fig. 5, var. ♂ ♀.

1895. **TROIDES,** *Genus*, Rothschild and Jordan, "Novitates Zoologicæ," vol. ii.; in the article on the Revision of Papilionidæ of the Eastern Hemisphere, exclusive of Africa, Rothschild and Jordan treat of the Ornithoptera under the generic name TROIDES, and give their synonomy. The following species, varieties, sub-species and aberrations are included in their list, together with localities, largely aided by Mr. Rothschild's wonderful series of the group, in the Tring Museum:

1895. **Troides Priamus,** page 185, note 1.
,, ,, type a., page 185.
,, ,, b. Euphorion, page 186.
,, ,, c. Richmondius, page 187, n.c.
,, ,, d. Poseidon, page 188, n. d. (a2) no name (var.)
(b2) ♂, aberration *Cronius*, Felder.
(c2) ♂, ab. *Eumæus*, Rippon, page 189.

1895. **Troides Priamus**, d. Poseidon, page 188, n. d. (d2) ♀, ab. *brunneus*, page 189.
(g2) Archideus, page 190.
(h2) Kirschi, Oberthür, ♀ ab. page 190.
(i2) Goliath,* page 190.
(k) ♀ ab. *Hecuba*, Röber, page 191.

1895. **Troides Priamus** (e) boisduvali, *Montrouzier*, p. 191.
,, ,, (f) Urvillianus, p. 191. (l2) ab. loc. *bornemanni*, Pagenstecher, p. 191.
,, **Crœsus**, p. 192, n. 2.
,, **Lydius**, p. 194, n. 3.
,, **Tithonus**, p. 195, n. 4.
,, **Paradisea**, p. 196, n. 5.
,, **Victoriæ**, p. 196, n. 6, p. 197 (b) T. Victoriæ reginæ, page 197.
,, ,, (c) T. ,, regis, p. 197.
,, **Brookeanus**, p. 198, n. 7. (a2) *Eleanor*, p. 199.
,, ,, **Albescens**, type p. 199, n. 9.
,, **Trojanus**, p. 199, note 8.
,, ,, type form, p. 202.
,, **Hippolytus**, p. 200, n. 9
(b) T. Hippolytus *Sulænsis*, p. 202.
(c) T. Hippolytus *Cellularis*, p. 202.
,, **Darsius**, p. 203, n. 10.
,, **Minos**, p. 203, n. 11.
,, **Vandepolli** (a) type, p. 205, n. 12.
,, ,, (b) honrathiana, p. 205.
,, **Haliphron**, p. 206, no. 13, type (a), p. 206.
(b) T. haliphron naias, p. 207.
(c) T. haliphron iris, p. 208.
,, **Staudingeri**, p. 108, n. 14.
,, **Plato**, p. 209, n. 15.
,, **Criton**, p. 210, n. 16.
(a2) typical ♀, similar to ♂.
(b2) oberthüri, ♀.
(c2) felderi, ♀.

1895. **T. Riedeli**, p. 211, no. 17.

1895. **T. Oblongomaculatus**, p. 211, n. 18; type form p. 213.
(b) bouruensis, page 214.
(c) celebensis, p. 214.
(d) papuensis, p. 214; (a2) ♀ ab. *papuanus*, Oberth., p. 215.

1895. **T. helena**, p. 216, n. 19 (a) type form, p. 217.
(a2) ♀ ab., Jupiter, Oberthür.
(b2) p. 217, ab. *Pluto*, Felder, p. 217.
(b) Troides helena *nereis*, page 218.
(c) T. nereis *propinquus*, Rothschild, p. 218.
(d) T. helena *cerberus*, p. 219.
(e) T. helena *hephæstus*, p. 222.

1895. **T. Æacus**, p. 223, n. 20.

1895. **T. Rhadamantus**, p. 227, n. 22. (a) type form, p. 225.
(b) Troides Rhadamantus plateni, p. 226.

1895. **T. Dohertyi** p. 223, n. 20.

1895. **T. Mirandus** p. 227, n. 23.

*I have shown in vol. ii. of this work that Goliath is not a Priamus form, but a species of Schoenbergia.

1895. **T. Andromache,** p. 228, n. 25. (a) type form, p. 229.
(b) Troides Amphrysus *Cuneifer*, p. 229.
(c) Troides Amphrysus flavicollis, p. 231.
(a2) ab. *Olympia*, p. 231.
(b2) ab. ruficollis, p. 232.
(d) Troides Amphrysus *Sumatranus*, p. 232.

1895. **T. Magellanus,** p. 232, n. 26.

1895. **T. Victoriæ,** Rothschild, "Entomologist," vol. xxviii., page 78.

1895. **Ornithoptera Hippolytus,** var. *Sulaensis*, Staudinger, "Iris," vol. vii., page 343 (the two sexes).

1895. **O. Hippolytus,** var. *Celebensis*, Staudinger, "Iris," vol. vii., page 342 (the two sexes).

1895. **Troides Victoriæ reginæ,** Rothschild, "Entomologist," vol. xxviii., page 78; also Tr. Victoriæ regis Rothschild, "Entomologist," vol. xxviii., page 78.

1895. **Ornithptra Richmondii,** Schneider, "Entomologist," vol. xxviii., page 93; (deals with the metamorphoses of the species), with a cut.

1895. **Troides Trojana,** W. F. Kirby, "Nature," vol. li., page 258, column 1.

1895. **Ornithoptera Hippolytus,** W. F. Kirby, "Nature," vol. li., page 255.

1895. **Papilio Vordermani,** Snellen, "Tijdschrift voor Entomologische," vol. xxxvii., page 191 (is *Dohertyi*).

1895. **O. Pompeus,** W. F. Kirby, "Nature," vol. li., page 254, column 2; also treats of the larva and pupa, page 255, column 1.

1895. **O. Dohertyi,** W. F. Kirby, "Nature," vol. li., page 255, column 2.

1895. **O. Paradisea,** Its Metamorphoses, Kubary, "Entomologist," vol. ix., page 103, plate 1, figs. 1, 2.

1895. **O. Urvilliana,** Its Metamorphoses, Ribbe, "Entomologist," vol. ix., pages 105-107, plate 1, figs. 3-6.

1895. **Troides Oblongomaculatus,** Rothschild, "Notes on Varieties," Nov. Zool., vol. 3, page 63.

1895. **T. Haliphron,** var. *pistor*, vol. iii., page 91.

1895. **T. Schoenbergi,** Röber, Ent. Nachr., vol. xxii., page 289.

1895. **Ornithoptera Magellanus,** W. F. Kirby, "Nature," vol. li., page 255.

1895. **Drurya Zalmoxis,** W. F. Kirby, the same work, vol. li., page 258, col. 1.

1895. **Ætheoptera ? Tithonus,** W. F. Kirby, "Nature," vol. li., page 256.

1895. **Ætheoptera Tithonus,** Rippon, "Nature," vol. li., page 343.

1895. **Ornithoptera Priamus,** W. F. Kirby, "Nature," vol. li., pp. 244-5, also O. Eumœus, page 256, col. 1; O. Crœsus, page 256, col. 2; O. Lydius, page 256, col. 2, O. Urvilliana, page 255, col. 1.

1895. **O. Urvilliana,** C. Ribbe, figures and description in the "Iris," July 15.

1896. **Papilio Zalmoxis,** W. F. Kirby, "Handbook to the order Lepidoptera," vol. ii., page 268.

1896. **Troides Crœsus,** W. F. Kirby, the same work, vol. ii., page 255; also *T. Lydius*, the same work, page 256; *T. Urvillianus*, page 255; *O. Amphrysus*, page 265; *O. Helena Cerberus*, page 264, larva and pupa, pages 264-6; *O. Magellanus*, page 265.

1896. **Ornithoptera Amphrysus,** E. Martin Duncan, in "Cassell's Natural History," vol. vi., page 51.

1897. **O. Urvilliana,** vars. *miokensis* and *flavomaculata*, Ribbe, "Entomologist," vol. xii., page 153.

1897. **O. Papuensis,** var. *Carolus*, Fruhstorfer, Berliner Ent. Zeitschrift, vol. xliii, page 306.

1897 O. (Pompeoptera), **Irregularis,** W. Dannatt, "Entomologist," page 312.

1897. **O. Victoriæ Regis,** Ribbe, "Deutsche Ent. Zeitschrift," Lepidoptera, vol. page 245, plate 8, fig. 1 (the pupa described).

1897. **O. Crœsus,** var. Fruhstorfer, "Illustrated Zeitschriff, Ent. v. page 197.

1897. **O. Goliath Titan,** var. Grose-Smith, "Rhopalocera Exotica," Ornithoptera, vol. iii. plate 4, page 7 (the ♂ of *Goliath.*)

1899. **Drurya Antimachus,** v. *Gigantia*, Walker, "Ent. Magazine," page 1899.

1899. **D. Zalmoxis,** Rippon, the present work, vol. i., page viii., plate iii. b (the ♀); also Schoenbergia Paradisea, vars. *Meridionalis*, flavescens, and *punctata*, pages xix. to xxi. (*Meridionalis*), (♂) as a species, not a var. of Paradisea, page xxi., plate iv. b, plate iv. a; also *O. Tithonus*, vol. i., page xx., plate vi.; *O. Poseidon*, var. Archideus, page 21, plate 7a; *O. Urvilliana*, green var., pages 46, 56, plate 18; the var. *Cælestis*, page 56, plate 19; *Ætheoptera Regis*, page 57, plate 20.

1899. **Papilio Antimachus,** and **Ornithoptera Victoriæ,** W. J. Holland, "The Butterfly Book," N. America, page 162; also O. Paradisea, page 162; and *Genus* Ornithoptera, page 272. The author on the latter page speaks of the Osmateria, or protrusive scent organs (i.e., the ♂ sexual brand), as serving for purposes of defence! A different theory from the earlier one, that they served to attract the ♀. Probably neither theory is correct.

1900. **Pompeoptera Miranda,** Rippon, the present work, vol. ii., pps. 70-71a, plates 66a, 66b, 66c (the 2 sexes and Melanistic var).

1900. **P. Iris,** Rippon, the present work, vii., plate 64b.

1902. The following Genera are characterised in Wytsman's "Genera Insectorum," *Lepidoptera Rhopalocera, Fam, Papilionidæ, Subfam Papilioninæ,* Section **TROIDES** by Rippon :—
Section **TROIDES,** Hubner, page 2 ; Genus **Drurya,** Aurivillius, type Antimachus, page 4 ; Genus **Schoenbergia,** Pagenstecher, type Paradisea, page 5 ; Genus **Ornithoptera,** type Priamus, Drurya, Boisduval, page 6, restricted by Rippon to the green group ; Genus **Ætheoptera,** Rippon, page 9, type Victoriæ ; Genus **Trogonoptera,** type Brookeana, Rippon, page 10 ; Genus **Pompeoptera,** Rippon, type *Helena,* page 11. A list of all the species and their geographical distribution is also given, with 2 plates.

1901-1903. **Ornithoptera Darsius,** Moore, "Lepidoptera Indica," vol. vi, page 140, plate 418, f. 1 ; larva and pupa 1a, 1b (the two sexes).

1901-1903. **O. Minos,** Moore, the same work, vol. v., page 142, plate 419, figs 1, larva and pupa, 1a ♂, 1b ♀.

1901-1903. **O. Cerberus,** Moore, the same work, vol. v., page 145, plate 420, fig. 1, a Sikkim ♂ ; 1a, a Karen Hill ♂ ; 1b, a Bhutan ♀ ; 1c. a Karen Hill ♀.

1901-1903. **O. Heliconoides,** Moore, the same work, vol. v., page 147; pl. 421, fig. 1, 1a ♂ ; 1b, 1c ♀ ; from Little Brother Island (Andamans).

1901-1903. **O. Æacus,** Moore, the same work, vol. v., page 148, plate 422, figs. 1, 1a (the two sexes).

1902. **Troides Amphrysus,** var. *Gardineri*=T. Ruficollis of Rothschild, *nec ruficollis of Butler,* Frühstorfer, "Osthälfte Sumatra" (Eastern part of Sumatra) page 57.

1902. **Troides Ruficollis,** var. ab. *nigricollis,* Frühstorfer, the same work, the aberration *birmeicollis* ♂ ♀ =flavicollis, Druce, from N. Borneo ; and *Amphrysus niasicus* from Nias ♂ ♀ the aberration *Olympia* of Honrath.

1902. **Ornithoptera Cassandra,** and O. Richmondia, Dodd, "Entomologist," page 17, the distinction between the two forms.

1903. **O. Miranda,** v. *neomiranda,* Frühstorfer, "Osthalfte Sumatra," page 1903 ; (gives the differences between the var. and the type form.

1903. **O. Paradisea,** ab. auriflua, Frühstorfer, "Societas Entomologica" (the organ of the Zurich-Hottingen International Entomological Society), page 51, from Kaiser Wilhelmsland.

1903. **O. Criton** *Critonoides,* sub-species, Frühstorfer, the same work, page 51, from Oby Island.

ADDENDA TO THE FOREGOING.

1764. **P. E. T. Panthous,** Linnæus, full title of the work "Lepidopterorum Musei Ludovicæ Ulricæ."

1842. **Ærnauta** (part) for Ornithoptera, proposed as a generic name), Berge, "Schmetterlinge," page 19.

1864. **Papilio,** Section 2, proposed by Felder for the Ornithoptera, "Verh. zu bei Ges. Wien," p. 290.

1874. **O. Hippolytus,** Hopffer, "Entomologische Zeitung," Stettin, page 17.

1876. **O. Crœsus,** J. Gibson," "Encyclopædia Britannica," 9th edition, vol. iv., page 595.

1879. **O. Priamus,** Oberthür, "Annali del Museo di Storia Naturale di Genova" (annals of the Natural History Museum of Genoa), page 466, var. *Aruana.*

1879. The same work: Beccari "on the difficulty of capturing the Ornithoptera, &c.," page 468.

1879 **P. Criton,** Oberthür, the same work, page 468.

1881. **Ornithoptera Priamus,** Konliga, "Svenska Vetenskaps Akademiens Hardlinger, page 8.

1895. **Æth. Victoriæ,** v. *Regis* ♂ ♀, Rothschild, "Entomologist," vol. xxviii., page 78.

1895. **Ornithoptera Urvilliana,** var. *Cœlestis,* ♂ ♀, Rothschild, "Novit. Zoologicæ," vol. v., page 216, n. 1.

ERRATA ET CORRIGENDA TO THE FOREGOING.

On page 95, transfer the lines with dates 1833 to follow those of 1832 ; also 1836 to follow 1835. On page 98 for "1765 O. Pegasus," read "1865" ; also on the same page for "1895 O. Helena," read "1865" ; on page 100 for "1877 O. Uruana," read "O. Aruana ; on the same page, 9th line from the bottom, for *baermanni read bauermanni* ; on page 102 for "1817 Ornithoptera" read "1887" ; on page 103 for "1880 O. Staudingeri" read "1888" ; on page 104, the first line from the top, for "1885" read "1896," and transfer the line to its proper position on page 108 ; on page 105 for "1862 O. Arruana," read "1892" ; on page 108, 13th line from the top for "Ornithptra" read "Ornithoptera."

On page 93, line 4 from below, for "Entomologie" read *Entomologiæ.*
On page 94, 11th line from below, for "Sammlung" read *Sammlungen.* Also on the same page, for "Aüslandisch" always read *Aüslandische ;* and on the same page, for "Verzeichniss" bekannt always read *Verzeichniss bekannter.*
On page 97, for "Monatschrift" always read *Monatsschrift.*
On pages 98, 99, for "Verhandeling" always read *Verhandlung.*
On page 99, for "Entomologische" read *Entomologie ;* on page 99, 6th line from below, for "Stett in Entomologische Zeitschrift" read *Stettiner Entomologische Zeitung.*
On page 100, lines 16 and 21 from above read *Entomologie* for what is printed ; Page 100, line 9 from above, for "Beittrag nur Kenntniss" read *Beiträge zur Kenntniss.*
On page 101, for "Jahrbüch Nassauischen Verhandeling" always read *Jahrbücher Nassauischen vereins für Naturkunde ;* also the same on pages 104, 105 and 106.
On page 102, line 15 from above for "Stettin" and "Zeitschrift" read *Stettiner* and *Zeitung.*
On page 103, line 23 from above read *Zoologischen Jahrbüchern Abtheilung für Systematik* for what printed ; also for "Jahrbüchen" read *Jahrbüchern.*
On page 104 and page 108, for "Entomologische" always read *Entomologie.*
On page 108, line 12 from below for "Zeitschriff" read *Zeitschrift.*

The following summary will show the order in time when the different species and varieties have been described—premising that their discovery may have preceeded by 6 or 12 months their description or iconography:—

1719. Pompeoptera Pompeus.
1719. Ornithoptera Priamus.
1753. Pompeoptera Hippolytus.
1758. Ornithoptera Priamus, ♀.
1764. Pompeoptera Helena, ♂.
1764. P. Hippolytus, ♂.
1779. P. Minos, ♀.
1782. Drurya Antimachus, ♂.
1782. Pompeoptera Amphrysus, ♂.
1800. P. Cerberus.
1815. Ornithoptera Poseidon, ♂.
1816. Pompeoptera Helena, ♀.
1821. P. Rhadamantus, ♂ ♀.
1829. Ornithoptera Urvilliana, ♂.
1832. O. Poseidon, var. *Archideus*, ♀.
1836. P. Rhadamanthus, ♀.
1836. P. Haliphron, ♂.
1841. Schoenbergia Tithonus, ♂.
1845. Pompeoptera Darsius, ♂.
1846. P. Æacus, ♂ ♀.
1852. P. Darsius, ♀.
1852. P. Poseidon, v. *pronomus*.
1852. P. Poseidon, v. *euphorion*.
1852. O. Richmondia, ♂.
1855. Trogonoptera Brookeana, ♂.
1856. Ætheoptera Victoriæ, ♀.
1856. Pompeoptera Cerberus, ♀.
1856. Ornithoptera Poseidon, v. *Boisduvali*, ♂ ♀.
1859. O. Crœsus, ♂.
1859. O. Aruana, ♂.
1859. Pompeoptera Haliphron, ♀.
1862. D. Zalmoxis, ♂.
1864. Ornithoptera Euphorion (Cassandra), ♀.
1864. O. Richmondia.
1864. Pompeoptera Hephæstus.
1864. Poseidon, v. *Triton*, ♂.
1864. Pompeoptera Magellanus, ♀ ♂.
1864. Ornithoptera Poseidon, v. *Oceanus*, ♂.
1865. O. Lydius, ♂ ♀.
1865. O. Crœsus, ♀.
1865. O. Pegasus, ♂ ♀.
1865. Pompeoptera Helena, v. *Papuensis*, ♀.
1869. P. Miranda, ♂.
1875. P. Ruficollis, ♂.
1877. P. Cerberus, v. *Heliconoides*, ♂ ♀.
1877. Ornithoptera Pegasus, vars. of Hirsch.
1879. Pompeoptera Criton, ♂ ♀.
1879. P. Helena, v. *Jupiter*, ♀.
1879. P. Helena, v. Heliacon, ab. rutilans, ♂ ♀.
1879. P. Haliphron, v. *pallens*, ♀.
1884. P. Haliphron, v. *Bauermanni*.
1885. Sch. Tithonus, ♀.
1885. Pompeoptera Riedeli, ♂.
1885. P. Helena, v. *leda*.
1885. P. Andromache, ♂ ♀.
1885. T. Brookeana, ♀
1886. T. Trojana, ♂.
1887. Pompeoptera Miranda, ♂.
1887. Ætheoptera Victoriæ, v. *Reginæ*.
1888. Sch. Goliath, ♀.
1888. Pompeoptera Plateni, ♂ ♀.
1888. P. Iris. ♂ ♀.
1889. T. Brookeana, v. *Eleanor*.
1890. Pompeoptera Nereis, ♂ ♀.
1890. Pompeoptera Vandepolli, ♂ ♁.
1891. P. Naias, ♂ ♀.
1892. P. Riedeli, ♀.
1892. Ornithoptera Poseidon, v. *Valentine*, ♂ ♀.
1892. P. Vandepolli, v. *Honrathiana* ♂ ♀.
1892. Drurya Antimachus, ♀.
1892. D. Zalmoxis, ♀.
1892. Ornithoptera Eumæus, ♂ ♀.
1893. Pompeoptera Socrates = Naias, ♂.
1893. P. Dohertyi, ♂ ♀, and vars.
1894. P. Helena, v. *Thestius*.
1894. P. Amphrysus, v. *Palabuana*.
1894. P. Cuneiferæ, v. *Sumatranus*=Ritsemæ.
1894. Ornithoptera Urvilliana, v. *Bornemanni*.
1894. Pompeoptera Oblongomaculatus, v. *Bouruensis*.
1895. P. Oblongomaculatus, v. *Celebensis*.
1895. P. Oblongomaculatus, v. *Papuensis*, and aberration *Papuanus*.
1895. P. Nereis, v. *Propinquus*.
1895. P. Hippolytus, v. *Sulaensis*.
1895. P. Hippolytus, v. *Cellularis*.
1897. Ornithoptera Urvilliana, vars. *miokensis*, and *flavomaculata*.
1897. Pompeoptera Oblongomaculatus, v. Papuensis, ab. *Carolus*.
1897. P. Irregularis.
1897. Sch. Titan, ♂.
1899. Sch. Meridionalis ♂ ♀.
1899. Sch. Paradisea, v. punctata.
1902. Pompeoptera Ruficollis, v. *Nigricollis*.
1903. P. Miranda, v. *Neomiranda*.
1903. P. Criton, v. *Critonoides*.

Supplementary Species or varieties discovered too late for inclusion in vol. i. of this work.

SCHOENBERGIA TITAN,

Ornithoptera Titan var. of O. Goliath, ♂, H. Grose-Smith, "Rhopalocera Exotica." Ornithoptera, vol. iii., plate iv., page 7. (1897).

In all the annals of Entomological discovery there have been no more wonderful revelations of extraordinary beauty and magnitude than among the two sections of the order Lepidoptera inhabiting the different latitudes of New Guineaand its adjacent islands, especially those of the south-eastern and eastern islands. There are multitudes of diurnal and crepuscular moths which outrival in variety of lovliness and in number of species, the productions of any other part of the world, not excepting even those of South America; and this applies to all the different families of Heterocera almost without exception. With respect to the Diurnea there has been a continual revelation of new species unsurpassed in beauty, and of rare species which were hitherto almost unique in European collections—the Lycænidæ for example. But among the most royal of all are the species of Papilionidæ, especially those of the group of **Troides,** which contains the Genus Schoenbergia, with its *Butterflies of Paradise*, as I consider they merit being called, of which the discoveries of the last ten years have filled the hearts of all enthusiastic students with astonishment and delight. There are no adjectives in any European language which can sufficiently express our admiration of these! As I have said in another place, they merit, as butterflies, a sentiment in our regards quite equal to that we feel when contemplating the perfections and attractions of the Paradise Birds, while in magnitude some of them at least, are the rivals of the American Morphos.

The insect from which the following species is described and re-figured by me, is the only example at present existing in Europe, so far as I am aware, and is the type of Mr. Grose-Smith's plate and description, published in his splendid work quoted above. It is one of the most magnificent additions he has had the good fortune to place in his extensive collection; and I am indebted to his courtesy and kindness for the pleasure of again recording it in my own way in this work.

Schoenbergia Titan was taken in 1901, about 30 or 40 miles inland from Kapa Kapa, in British New Guinea. *Sch. Goliath*, the ♀ of which is figured in the 1st volume of this work, would almost appear to be the consort of Titan:—probably this is the case; but as *Goliath* inhabits Kapaur, in Dutch territory, and hundreds of miles from the locality of Titan, we cannot feel justified in definitively assuming that the two forms belong to the same species until we obtain more material for study—especially when we consider the exuberance of variety of insect life in New Guinea.

♂. Anterior wings sub-scalene-triangulate; somewhat acute at the apex; the costa gracefully arcuate; the outer margin nearly straight, with only the slightest indications of the usual marginal fringe curvatures; with no marginal white lunations, as are in most of the species of the Troides; the inner margin is also nearly a straight line from the posterior angle to the base; colour of the wings rich golden green—ranging in tint from golden-emerald and apple-green, through every degree of shade to a coppery or golden-yellow, according to the position in which it is held, as the light falls upon it; thus, if held exactly opposite the light the wings are entirely green except below the submedian nervures, where they become coppery yellow: viewed obliquely against the light, we obtain the coppery-yellow tone, according as the insect is turned about. The green of the upper portion of the wing is divided by a broad belt of velvety-black from the outer margin to the base, occupying about two-thirds of the discoidal cell at its distal end, and broadening till at the basal end no green remains—this area of black also extends outside the cell on the disc to the apical angle, and below the median nervure is continued so as to form three dentate patches of black between the 3rd discocellular and 1st median, and the 1st and 2nd, and 2nd and 3rd median branches; it also is prolonged from the apical to the posterior angles as a broad but gradually narrowing submarginal black band; the costa is narrowly black, and with the subcostal nervure encloses a subcostal green stripe; the veins are all very stout, and sufficiently expressed, even in the green—the submedian and internal nervures being black.

Posterior wings rounded in outline, with graceful but slight marginal incurvatures between the vein terminals, and distinctly excurved at the anal angle in a manner quite unlike the outline of the posterior wing of any other Ornithopteron.

Colours: silky golden yellow, except for a very broad abdominal area of velvety-black, which also occupies nearly all the space from the median vein and its 2nd branch from the base to the anal angle of the wing, curving farthest from the median between its 2nd and 3rd branches. A narrow curved streak of golden yellow is at the edge of the abdominal margin, from the base; a narrow submarginal band of black extends round the wing from the apex into the inner marginal area of black, and is narrowly scalloped above with a delicate olive-green, which also borders the nervures; there are three rather large sub-orbicular discal green spots between the nervules of the upper half of the wings, each one pupilled in its inner end by a black spot; the veins of the wing are brown greenish-black, and quite distinctly expressed.

Under surface of anterior wings silky greenish-golden yellow, varying in amount of colour according to the position in which the light falls upon it; the apex and upper part of the cell is more richly green; the costa black; a moderately broad posterior marginal band of black, curves towards the veins in this way ⌒⌒⌒⌒⌒⌒ the distal end of each vein disappearing in the apex of each curve; the interior black margin of the wing is a continuation to the base of the outer marginal band; there are 4 small sub-lunate discal black marks between the 1st and 2nd discocellular, the 2nd discocellular and first median and downward to the 3rd median veins; below, on the submedian fold is also a minute black spot; between the 4th and 5th subcostal nervules is a patch of black atoms or scaling; the veins are all strongly expressed in black, especially the median branches; the pseudoneura of the cell are only very faintly shown at their distal ends, and appear to be arranged differently from those of other species, as will be seen by reference to my plate. Under surfaces of the posterior wings as on the upper, ex-

cept that the yellow of the wings is even a richer gold, and still more silky in texture; the three discal black orbicles are slightly edged with green, and the entire area of abdominal-marginal and submedian black of the upper surface of the wings is replaced on the under surface by golden green, with a clouding of yellow; the black veins are very thinly and delicately shown, except the basal section of the median vein which is stoutly black; the costa narrowly black; the outer margin only very thinly outlined in black; the abdominal marginal-fringe of hairs light burnt-sienna colour, and not very prominent.

Head black; eyes, deep brown, underlined with ochraceous whitish-yellow; thorax, velvety black; antennæ, black; abdomen, golden orange yellow, with a triangulate dorsal black mark on the anal segment. Thorax beneath, black, with a small red pectoral patch only; legs, black and with the tibia shaped like that of *Sch. Meridionalis* ♂, (resembling the tibia of some of the Hymenoptera), as will be seen by reference to the plate; this applies only to the 2nd and 3rd pairs of legs, especially the latter; abdomen, yellow, black at its junction with the thorax—the first three or four articulations are black, with a row of a small lateral black dots. The wings are without the marginal light fringe-lunules found in most of the Ornithoptera; but it may be pointed out that this is the case with all the ♂ ♂ of the Genus Schoenbergia, *O. Priamus*, and the upper sides of some other species of the Genus Ornithoptera, but not on the undersides. In Schoenbergia the lunules are not found on either surface, but are always present in the females.

Anterior wing: length of costa 94 mms.; of posterior margin 61 mms.; of interior margin 55 mms.

Posterior wing: greatest length 60, and greatest width 48 mms.

Length of thorax with head, 22; of abdomen, 45; and of antennæ 36 mms. The antennæ are delicately graceful in form and thin—as in all the species of the genus the apex being very little thicker than it is at its base.

Length of Legs.	1st pair;	femur,	14;	tibia,	10;	tarsi,	15	mms.
	2nd ,, ;	,,	15;	,,	16;	,,	17	,,
	3rd ,, ;	,,	16;	,,	15;	,,	19	,,

Habitat: Kapa Kapa, British New Guinea.

In comparing Titan with some of the species of the other genera of the **Troides** we notice that in all the ♂ ♂ of the *Schoenbergiæ* golden or apple green, and a richly glowing silky golden-yellow occupies a larger space on each surface of the wings than does the black. This yellow is not found in any of the ♂ ♂ of the Genus Ornithoptera, except sparingly. In *O. Priamus* only one small patch is found on the under surface of the posterior wing, with one or two minute yellow dots. and a longitudinal dorsal stripe in the lemon yellow of the abdomen. In *O. Cassandra* there are sometimes as many as six or seven submarginal spots, in *O. Richmondia* there is a similar arrangement; in *O. Poseidon* five or six in similar positions; in *O. Cræsus* there are several of different shapes above in the golden scarlet, and below in the green of the posterior wings; fewer in number but larger in area in *O. Lydius;* very small dots on the undersides of the posterior wings of *O. Urvilliana.* In the Æ theopterons only two, three, or four small spots on either surface of the posterior wings, set in the midst of a bright lemon yellow. In the Pompeoptera species we do not meet with quite the same quality of yellow.

The anterior wings of *Sch. Paradisea* ♂ have the brighter areas of colour arranged nearly the same as in Titan, so also do those of *Sch. Meridionalis* and *Tithonus* but this is never the case with the species of the other genera. In all the species of Schoenbergia, the arrangement of colours of the posterior upper surfaces is similar in plan—the black always occupying the same position, the yellow becoming more and more dominant till we reach Titan, where it almost entirely fills the wing area: the same may be said of the under surfaces. In general appearance the form of Titan, though larger somewhat, suggests that of *O. Priamus* or *O. Cræsus*: the abdomen also bears a resemblance to the bodies of those species.

A more detailed description of the legs of this species studied microscopically will, by the aid of detail figures in my plate, give a faint idea of their character. Of course, the following is only a very slight contribution to an examination of the anatomical structure of the legs. We take the posterior or 3rd pair of legs first for obvious reasons.

The tibia at midway of its length on its outer side, nearly three times the width of the tarsus; quite smooth and nitid, or without scales or setæ; also slightly depressed midway, and tumid at the junction (or *torulus*) with the tarsus; on the side that presses close to the thorax, the tibia is convexed, or raised down the middle, so as to allow the femur to be pressed close to the outer side when in a state of rest; on the side opposite, which is also smooth, where the femur is pressed, is a shallow groove 4 or 5 mms. long, within five or six mms. of the junction with the femur. What purpose this serves it is difficult to say. The inner edge of the tibia, i.e., nearest to the femur is furnished with two or three rows of very minute setæ; there are the usual two short spines at the torulus in which the tarsus is inserted; the femur is about half the width of the tibia, with delicate setæoid scales; concavely depressed along its entire length on both sides, so that its outer edge is distinctly carinated; nearly close below the point of union with the apex of the tibia the femur widens out a little on either side, with a distinct transverse indentation, and a slightly irregularly-shaped depression above it. The tarsus is furnished along its entire length with a multitude of setæ of varying length; the first joint is twice the length of the second; the second 1½ times that of the third, fourth or fifth, and the ungues of the 5th joint are only normal in length. The median or second pair of legs, are fashioned nearly like the 3rd pair, but the femur and tibia are about half the width or thickness of the 3rd—the tibia being the widest; the ungues longer than in the third. The anterior pair of legs are grooved, moulded, and carinated much like the 3rd pair—the scale-like spur nearly half-way of the length of the tibia, and gracefully formed; the 1st joint of the tarsus nearly three times as long as either the 2nd, 3rd, or 5th, the penultimate or 4th joint shorter than either; the ungues equal in length to those of the median pair of legs. Close to the junction of the tibia and femur, where they press together in a state of rest is a small, nearly U-shaped yellow patch, which, viewed microscopically, appears to be a bladder-like group of muscles, somewhat like a similar organ to be found on the legs of many Lamellicorne and Longicorne Coleoptera except that the latter are generally covered superficially by pulvilli: these may, in the butterfly, act as a pad for the prevention of friction, or may be slightly elastic in their function, or serve both purposes. Only careful dissection could decide the question.

SCHOENBERGIA GOLIATH. ♂.

Troides Goliath, ♂. Rothschild, "Novitates Zoologicæ," Vol. xi, page 311. (1904).

Since writing the preceding pages, and drawing the plate of Sch. Titan, I have had the opportunity of studying and figuring the true ♂ of Sch. Goliath, and the true ♀ of Sch. Titan; by which it will be seen that though there is a significant similarity between the two nominal species, there are yet some important differences between them, especially in the females; and it will be evident that Titan can only take rank as a local variety, or at most as a subspecies of the former.

♂ Anterior wings: above intense velvety black and rich golden green—the areas of each being arranged almost in the same design as is Grose-Smith's *Titan*, with the following small differences:—The base of the wings in *Titan* is not entirely black, as two subcostal green lines from the base enclose the subcostal nervure, while in Goliath this is not the case, in the example before me—the base being black. In Goliath the space between the 3rd median nervule and the submedian nervure is plentifully sprinkled with the black scales, which on the nervure become a graduated black patch reaching nearly to the outer marginal band of the wing: in *Titan* this space is almost free from the black scaling: the black scaling is also more extensive in Goliath than in *Titan*; and the general green of the wing, though in some lights more golden, has not in any light the vivid tint of yellow as in *Titan*; when viewed obliquely against the light the anterior wings are as golden as is *O. Cræsus*. The most vivid green is on the costa of the wing.

Posterior wings: vivid silky golden yellow as in *Titan*—all the veins showing conspicuously in black or intensely rich green—much more so than in *Titan*; the 3 discal orbicular spots are of the same prominent green, the lowest of the three being the largest, and enclosing a small black spot or pupil; the black marginal border and the black submedian areas are edged with the same green: and from the band of the wing the inner or abdominal margin has also a short curved green line.

Under surface of anterior wings: similar to that of *Titan*, with the following exceptions: the upper margin of the discoidal cell along its entire length is rather broadly black. The space between the 4th and 5th subcostal nervules is nearly entirely black, with a green latitudinal stripe nearest the outer margin, and the submedian black is rather more extensive than in *Titan*. The wings very golden green—almost yellow, but the upper and outer parts of the wings are a deep green.

Posterior wings as in *Titan*, except that the discal black spots are smaller in proportion, and the lowest nearly square, and slightly edged with green, the inner golden yellow is silky brownish-golden.

Thorax, head and antennæ as in *Titan*; eyes black; abdomen not quite so ruddy yellow as in that variety.

Length of Costa 82 mms.; of outer margin about 45 mms.; greatest length of posterior wing 50 mms.; greatest width of wing 36 mms.; length of abdomen or antennæ 34 mms.; of thorax with head, 22 mms.

Length of Legs	1st pair:	femur, 12;	tibia, 9;	tarsi,	14	mms.
	2nd ,, ;	,, 13;	,, 14;	,,	18	,,
	3rd ,, ;	,, 13:	,, 14;	,,	18	,,

Habitat: Geelvink Bay, Dutch New Guinea.

The great similarity of this form to Mr. Grose-Smith's *Titan* indicates that Oberthür's Goliath is entitled to stand as a representative species, and *Titan* as a local variety of Goliath.

SCHOENBERGIA GOLIATH, *var. Titan.* ♀.

Troides Goliath, v. *Titan,* Rothschild, "Novitates Zoologicæ," Vol. xi., page 312 (1904).

♀. Anterior wings: warm dark brown of a uniform tint; the veins all sufficiently visible; between the 3rd and 4th, and the 4th and 5th subcostal nervules are two almost obsolete small groups of white atoms; a row of 3 minute submarginal gray-white spots, situated from below to the space between the 2nd and 1st median nervules; also a discal gray white cuneiform spot between the 2nd and 3rd median nervules.

Posterior wings: the same dark brown as on the anterior wings; the discal light area, about equal relatively to that of the type of *Goliath*; this area is very creamy-white above the discal band of black orbicles, and very rufous beneath them; the band of black orbicles is 6 in number, the penultimate upper one being the largest, and coalescing almost with the uniform dark area of the wing; a black spot is situated also in the upper part of the abdominal light space; the abdominal margin is nearly orange yellow; the dark outer marginal band is lunate in the same manner as in *Goliath*.

Under surface of anterior wings as above, except that the light spots are more numerous, and rather larger. The submarginal band consists of small spots, subcuneiform, the upper ones being mere specks of grey; there is also a spot corresponding to that on the upper surface.

Under surface of posterior wings as above: the light area a pure buff white above the orbicles, and orange buff below them, becoming very rich buff orange at the anal angle; the black orbicles are ovoid in form; and the light area is not subdued by brown scales, as on the upper surface of the wing; but the dark area nearest the submedian black spot is modified by buff white scales.

The thorax, head and antennæ as in *Goliath*; the abdomen above, grey, the sides and subdorsum rich buff orange—the articulations being broadly black. Length of costa 119, of outer margin 75, and inner margin 60 mms. Greatest length of posterior wings 74 mms.; greatest width 60 mms.

Length of abdomen or antennæ 39, and of thorax with the head 23 mms.

Length of Legs	1st pair:	femur,	12;	tibia,	9;	tarsi,	9	mms.
	2nd ,,	,,	16;	,,	15;	,,	18	,,
	3rd ,,	,,	14;	,,	15;	,,	20	,,

When viewed obliquely opposite a strong light the dark parts of the wings exhibit distinct cupreus reflections.

Hab. Aroa River, British New Guinea.

In the Tring Museum.

It will be seen that the differences between the ♀ ♀ of *Goliath* and Titan are comparatively slight, except that *Goliath* contains a moderately large white indented mark in the cell of the anterior wings, and that instead of the numerous white spots of *Goliath* on the anterior wings, the same wings of Titan are nearly immaculate. Both forms appear to occur in Dutch and British New Guinea, and probably all over this great island.

The following table of the ♂ ♂ will enable us to readily separate the species of this genus:—

A. Anterior Wings.

1. Costa nearly 5·3rds the length of the interior margin, *Titan*; nearly 2 and 1·4th times, *Paradisea;* 2 times the length, *Meridionalis*; about 1 and 3-4ths, *Tithonus;* nearly two times, *Goliath*.
2. Inner margin of wings straight, *Titan*, *Goliath*, *Paradisea*, *Tithonus*; nearly straight, *Meridionalis*.
3. Wings larger and wider than the posterior wings, *Titan*, *Paradisea*.
   3a. Much larger, *Meridionalis*.
   3b. Very little larger, *Tithonus*.
   3c. Wings larger, but the same width as the posterior wings, *Goliath*.
4. The 3rd subcostal nervure emitted close to the apex of the discoidal cell, *Titan*, *Paradisea*, *Meridionalis*.
   4a. The 3rd subcostal nervure emitted at 3 millimetres below the apex of the cell, *Tithonus*
   4b. The 3rd subcostal nervure emitted at 2 mms. below the distal end of the cell, *Goliath*.
   4c. The 4th and 5th subcostal nervures emitted at 8, 9 or 10 mms above, or beyond the apex of the cell, all 4 species.

B. Posterior Wings, ♂.

1. Wings rounded, *Titan*.
   1a. Irregular in form or outline, *Tithonus*.
   1b. With a caudal prolongation of the 3rd median nervure, or tailed, *Paradisea*, *Meridionalis*.
      1bb. The terminal of the tail leaf-like, *Meridionalis*
         1bbb. Costa nearly straight; the rest of the wing outline somewhat rounded, but terminated almost to a point at the anal angle, *Goliath*.
2. Upper surface of wings yellow, green and black, *Paradisea*, *Goliath*, *Titan*, and *Meridionalis*; the black of the latter broken up into lines.
   2a. Wings of the 3 colours, with 3 orbicular black discal spots, *Tithonus*.
      2aa. With three orbicular green discal spots, black pupilled, *Titan*.
         2aaa. With 3 orbicular green spots, the lowest with a black pupil, *Goliath*.
   2b. Under surface of wings without black orbicles, *Paradisea*, *Meridionalis*.
      2bb. With black orbicles, and marks, *Titan*, *Tithonus;* in the former there are only three.
         2bbb. With 3 black orbicles only, *Goliath*.
3. With white abdominal marginal fringe of long hairs, *Meridionalis*.
   3a. The fringe creamy white, *Paradisea*.
   3b. The fringe sienna colour, *Tithonus*.
      3bb. The fringe very short and light sienna colour, *Titan* and *Goliath*.

C. Head.

1. Antennæ of *Titan* and *Goliath* slim like those of *Goliath* ♀.
2. Eyes lighter than in the other species of the genus.
   2a. Eyes darker, *Goliath*.

D. Thorax.

1. Thorax entirely black, *Titan*, *Tithonus*, *Goliath*.
   1a. Not entirely black, but with a longitudinal leaf-like yellow mark, *Paradisea*.
   1b. With four greenish-yellow marks, *Meridionalis*.

E. Abdomen.

1. Golden yellow, *Paradisea*, *Tithonus*, *Titan*, *Goliath*.
   1a. Lemon-yellow, *Meridionalis*.
2. With a long dark striped longitudinal mark, *Paradisea*.
   2a. With a simple grey longitudinal stripe, *Meridionalis*.
      2aa. With no longitudinal, or only a faintly greenish, stripe, *Tithonus*.
         2aaa. With no longitudinal stripe, *Titan*.

F. Legs.

1. Legs black, *Titan*, *Tithonus*, *Goliath*.
   1a. Femora light yellow, *Paradisea*.
   1b. Femora White, *Meridionalis*.

The Localities of the different species of this Genus may again be given here, for reference :—

Schoenbergia Paradisea, Finisterre Mountains, German Coast of New Guinea, in south latitude (about) 5°30′ to 7°0′, and East longitude 146°0′ to 147°15′.

***Sch.* Paradisia,** *var. Flavescens*, Etna Bay, Dutch S.W. Coast of New Guinea, in east longitude (about) 134°45′, and south latitude 3°30′.

***Sch.* Paradisea,** var. *Punctata*, Erima, Astrolabe Bay, German Coast, in east longitude (about) 146°0′ : and south latitude 5°50′ to 6°0′.

***Sch.* Meridionalis,** Mailu, British Territory and other parts of the same territory, extending probably from east longitude 143°0′ to 149° ; and south latitude 8°30′ to 10°15′.

***Sch.* Tithonus,** in Waigiu Island, Dutch Territory, east longitude (about) 130°10′ to 131°35′ ; and at Kapaur, the Western Province of Onan, along the coast probably from east longitude 132°15′ to 134°0′, and south latitude 2°15′ to 4°0′.

***Sch.* Goliath** ♀ , also at Kapaur, Dutch Coast, and at Mailu, British S.W. Territory, in east longitude, 146°40′ and nearly the same latitude as that of Kapa Kapa.

***Sch.* Titan,** ♂ , at Kapa Kapa, British (south coast) Territory, in east longitude (about) 147°20′, and south latitude (about) 9°45′.

***Sch.* Goliath,** ♂ Geelvink Bay, Dutch New Guinea, in east longitude, about 135°, and south latitude, about 3°30′.

***Sch.* Titan,** ♀ Aroa River, British New Guinea, in east longitude, about 146°40′ and south latitude from 8°0′ to 8°50′.

ÆTHEOPTERA VICTORIÆ *v. Rubianus.*

Troides Victoriæ, *Rubianus*, Rothschild, "Novitates Zoologicæ," Vol. XI., page 654 (1904).

♂. Anterior wings differ from those of the type form (figured on Plate 21A of Vol. I. of this work) in the following particulars :—the green of the wings is of a deeper and bluer colour, especially towards the costa. This colour is more graduated into a rather warmer tint towards the lower part of the wing; the subapical patch is much smaller than in *Reginæ* and blue green shaded into yellow green on the outer side; also strongly intersected by the black veins.

Posterior wings: bluish green graduated into a lighter golden green; not modified by scaling as in the type, or at least very sparingly; the lemon yellow submarginal band (with its three golden orange enclosed spots seen in the type) is entirely absent in this form; the black outer marginal band is considerably broader than in the type. The left hind wing and right fore wing have fiery orange and violet reflections when viewed against the light, and around the sexual brand the black is shot with an opalescent blue and violet silky sheen.

Under surface with all the green marks of the fore wings nearly as darkly green as above, and more blue towards the costa.

Under surface of the posterior wings golden green, somewhat darker than in the type form, much warmer golden towards the abdominal margin; with no golden internervular submarginal spots as in the type, and the submarginal black spots at the terminals of the veins much larger than in the type, and of fullest width united to the fringe; the costal marginal black also wider than in the type.

Thorax, head, and antennæ intensely black; abdomen rich buff, with a central longtitudinal faintly pink stripe, lateral rows of 4 black marks, and beneath 2 lateral and a central subdorsal black stripe extending from the base to the end of the anal valves.

Length of costa, 71 mms.; greatest length of the posterior wing, 54 mms.; greatest width, 37 mms.; length of antennæ or abdomen, 32 mms.; of thorax with head, 21 mms.

Length of Legs	1st pair:	femur,	12;	tibia,	10;	tarsi,	14	mms.
	2nd ,,	,,	10;	,,	14;	,,	17	,,
	3rd ,,	,,	13;	,,	12;	,,	17	,,

Habitat: Rendova, Solomon Islands (Meek).

When viewed from a distance againt the light the upper green surface of this form appears a deep olive blue green; if seen obliquely in the same position it appears, like all the ornithoptera, a rich cupreus red, with a silky, almost metallic chitonous sheen around the sexual brand. This variety is remarkable as being a distinct departure from the patterns of the others forms of Victoriæ, and especially from the absence of the yellow submarginal band of the hind wing—facts that would almost warrant its being given full specific rank, that is as species are made.

I am indebted to the liberality of the Hon. W. Rothschild for the loan of his unique specimen, and type.

♀. Anterior wings very dark smoky brown, darkest towards the base; with an outer submarginal band of 8 large warm gray internervular spots of diverse shapes, the largest being between the 3rd median and sub-median veins; an inner transverse band of discal large gray marks and spots, sub-lunate without,—the lowest, between the median and sub-median veins, becoming very narrow at its lower part, then widening and re-uniting with the gray area that fills 2-3rds of the inner marginal space from the base. Within the cell is a basal patch of gray, scaled with greenish yellow on the black to 1-3rd, and a large creamy gray patch from midway of the cell to near its distal end, broadly indented from the distal end by a wedge of black; the base of the interior or inner margin is also scaled like the base of the cell.

Posterior wings black or fumous brown; base of cell and above it scaled with golden gray; the disc creamy gray, with an extra band of internervular conical large black marks, two of them separated from the black veins, and lunate towards the outer margin by the gray sub-marginal marks that follow; the gray extends also to the inner, or abdominal margin; the first 4 veins are broadly black, and the outer margin very broadly black, as it is entirely a continuation of the discal black of the wings.

Under surface of anterior wings: with all the markings as above, except that the discocellular mark is edged with chrome yellow at its basal end. The basal patch is yellow and faintly scaled, and there are 2 internervular yellow stripes between the first 3 subcostal branches.

Under surface of posterior wings: all markings nearly the same as above, except that the basal patch is rather more extensive and chrome yellow, and the upper and lower divisions of the discal light area are of the same yellow, graduated into the gray; a small black dot is found also in the subcostal yellow division, and the yellow suffuses the gray submarginal mark between the 1st and 2nd subcostal nervules.

The thorax, head, atennæ and base of the abdomen are black; the abdomen above creamy buff white, becoming yellow at the sides and subdorsum, and the usual lateral black dots replaced by a continuous broad black line united with the subdorsal black; the lower yellow articulations strongly divided with black, and a subanal black mark.

Length of costa, 101 mms.; of outer or hind margin, 70 mms.; and of anterior or inner margin, 55 mms. Greatest length of posterior wing, 75 mms.; greatest width 46 mms. Length of abdomen or antennæ, 37 mms.; and of thorax with head, 24 mms.

Habitat: Rendova, Solomon Islands (Meek).

In the Tring Museum.

The pattern of Rubianus is sufficiently distinct from that of the females of the type form; but the greatest distinctness from the type of Victoriæ is in the ♂, as I have shewn above. Even the outer margin of the anterior wings of Rubianus is more equally curved from the apical angle to the base of the interior margin than in the type *Victoriæ*.

ÆTHEOPTERA VICTORIÆ, *var. Isabella.*

Troides, Victoriæ, *Isabella*, Rothschild, "Novitates Zoologicæ" Vol. II., p. 655 (1904).

♂. Anterior wings: most closely resemble the example of *Æ. Reginæ* figured in Vol. I. plate 23b of this work. The differences are comparatively few, and are as follows:—The large subapical green patch is golden green all over, with green atoms along the 2nd and 3rd submedian branch, extending inward a little beyond the apical patch as a narrow line; the inner outline of the patch is more irregular than in *Reginæ*, and the lower end is not pointed as in *Reginæ*. The colour of this green patch is subject to variation of intensity, according to the position of the insect, but is not so golden-shot as in *Reginæ*, at least on the right wing, whatever light it may be viewed in—but on the other wing it becomes a very vivid greenish golden yellow as in *Reginæ*; the lower 3rd of the patch has on the inner side a small black spot encroaching on it, the size of the patch is relatively to the size of the insect, the same as in *Reginæ*. The basal area of colour is a slightly warm veronese green, more golden near the precostal nervure, as in the types of *Victoriæ* and *Reginæ*. This basal green area does not become very much more golden even when viewed opposite the light. The discal black invades the green with a large indentation between the median and sub-median nervures, and the whole of the dark cell area, and that above and around the sexual brand is, in the proper light, beautifully opalescent.

Posterior wings: closely resemble those of *Reginæ* (see Vol. I., plate 23b, figure 1), except in the green being a richer and more uniform colour, though still tending to become rather golden towards the base, as in *Reginæ*; the black scaling in the cell is intense, extending from the distal end nearly to the base as a black jewelled cone, with its apex at the base of the wing as a fine point, all the veins being margined on both sides with green scales which extend on to the disc, as in all the other forms; indeed the ground plan of the wing is a uniform velvety-black surface, on which the green pattern with all its minute details is produced by more or less green scaling, until the golden-green submarginal band is reached, where the colour is a continuous band of four rich golden-green curved maculæ, extending from the anal to near the apical angles—the three lower ones enclosing vivid golden orange spots—all of which by contact with the deep black of the disc and margins, causes the colours to appear inexpressibly vivid and beautiful.

[There are several ways of viewing this insect, if we wish to understand its beauties:—(1) Seen very obliquely opposite the light, the black of the lower wing is shot with rich purple and violet. (2) Opposite the light in a natural position, the green of all the wings is nearly golden and the yellows all become inexpressibly silky golden, especially on the left wings; and the black of the cell, and below it are a subdued opalescence. (3) Viewed very obliquely against the light, the greens become cupreus, and the yellow saffron coloured, the black of the cell like polished metal with intense ultramarine blue, while the opposite wing may be opalescent with blue and gold and along the edges of some of the veins and the submedian fold we have flaming ridges of fiery brilliance. (4) Viewed against the light at a moderate distance, all the green becomes deep and dark, and if the distance is a little increased, the green of the cell and disc appear quite violet black, and the anterior wing apical patch and posterior green and golden band are very greatly subdued. It is evident that, as is the case of Humming Birds and Birds of Paradise, in a state of nature, when flying or even resting, these insects must often be nearly invisible, or so modified in appearance as to appear anything but what they are.]

Under surface of anterior wings: as in *Reginæ*, except that the cell and subdiscal areas of black are rather more extensive, the median nervure and its branches more broadly black bordered, the whole appearance of the wing pattern is bolder, and the green areas not quite so golden; there is also a black spot between the 3rd and 4th submedian veins. Under surface of posterior wings as in *Reginæ*, but more uniform in its golden tint, and the three submarginal orange spots are rather larger and more elongate than in *Reginæ*. [Viewed very obliquely against the light the green of the wings appears vivid saffron yellow; opposite the light intense golden green.]

Length of costa 30 mms.; greatest width of primary wing 35 mms. Greatest length of posterior wing 60 mms.; greatest width 34 mms. Length of abdomen 36, of antennæ 34, and of thorax with head 34 mms. The colour and markings of the abdomen do not differ from that of *Reginæ*.

Length of Legs	1st pair:	femur,	12;	tibia,	8;	tarsi,	15	mms.
	2nd ,,	,,	13;	,,	13;	,,	15	,,
	3rd ,,	,,	11;	,,	14;	,,	18	,,

Habitat: Isabella Island, Solomon Archipelago. (Meek).

In the Tring Museum.

This variety is most closely allied to *Reginæ*, Salvin.

ORNITHOPTERA ARUANA, *v. Obiensis.*

As I have been quite unable to ascertain in what publication this insect has been described, and by whom, and also its name, though I have been assured that it has been described by a Dutch Entomologist, I have thought it best to provisionally propose the above name, v. *Obiensis*, so as to prevent further delay. Later on, if I obtain the required information, I will acknowledge it, when the above name may or may not, become a synonym.

♂. Anterior wings: deep velvety black, with a discal warm brown pupæform sexual mark; the subcostal colour band is silvery greenish azurine blue, rather broad uniformly, extending from the base to the apex of the wing; the interior submarginal band of the same green extends from the base till half way up the outer margin of the wings, when it becomes divided into three twin spots to within a little distance from the apex, the highest spot small and composed of bluish-green atoms; the median nervure slighty indicated by a line of bluish atoms, otherwise the neuration is only obscurely to be seen.

Posterior wings of the same greenish blue, the veins, other than the subcostal and median, only faintly seen; a few delicate black hairs flow from the base into the cell a little below it, and a few black atoms are equally scatered over the wing, but can only be seen by examining the wing closely; there are 8 lemon-orange internervular spots (nearly obsolete) near the outer margin; and a narrow black submarginal border; the abdominal marginal fold is dark brown. [Viewed obliquely opposite the light, the left lower wing becomes a brilliant silvery azure blue, with salmon coloured reflections, and the colour band of the anterior wing silvery green; opposite the light, in the ordinary way, the wings are warm bluish silvery green; viewed against the light the wings become lilac, and slightly saffron green; obliquely they are entirely suffused with silvery salmon tints.] The longitudinal thoracic mark the same colour as in the wing.

Undersurface of anterior wing, with the transverse discal colour marks silvery azure-blue on the lower three, and all the others to the sub-costa silvery olive green; the distal end of the cell on its lower half with a moderately large green spot, extending nearly half way towards the base, and there is a short elongate and green congeries of atoms close to the submedian nervure, midway of the cell.

Under surface of the posterior wings golden green, but with the lower half of the cell, and part of the area beneath the median nervure silvery azure blue; an elongate spot of golden yellow between the costal and subcostal veins; a transverse band of suborbicular black discal spots, 5 in number, followed by an outer row of golden yellow spots; the submedian area half-way from the anal angle rich yellow, shading into the blue above; the abdominal fold vivid brown, and fringe of hairs chestnut tint.

[Viewed opposite the light the appearance is nearly normal, or very slightly warmer; obliquely against the light the colours are subdued, and shot with a saffron yellow sheen, except on the blue; when the sky is clouded the greens appear olive toned.]

The abdomen is golden orange yellow as in *Eumæus*. Length of costa 76, of hind margin 53, and of inner margin 35 mms. Greatest length of posterior wing 44, and width 35 mms. Length of abdomen or antennæ 34, and of the thorax with head 21 mms.

Habitat: Obi or Oby Major. (Waterstradt).

Obi is a small island S. of Batjan, or slightly S.W. of Djillolo, in about E. longitude 127°22′ to 123°12′ and about S. latitude 1° 18′ to 1° 14′.

This form, probably a local variety of *Aruana*, appears to be closely allied to *Eumæus*, and is another of those transitional links between *Aruana* and *Urvilliana*, of which more will probably come to hand in the future.

The most important difference between Obiensis and *Eumæus* is the character of the different blue colours. In Obiensis also the blue extends uniformly over the coloured portions of the wings; in *Eumæus* there is a decided patch of green on the posterior wings to below the first subcostal nervule; there are discal black orbicles towards the outer margin, in Obiensis there are none, but there are two small yellow spots and traces of a third; and while on the anterior wings the median vein and its branches are well marked with green atoms, only a few blue atomic scales indicate the direction of the median vein in Obiensis. On the under-surface of *Eumæus* the cell is nearly occupied by the green area, while in Obiensis less than 1-4th of the cell is coloured. On the posterior wing of *Eumæus* there are no submarginal golden spots, but in Obiensis they are fully present.

In the Tring Museum and other collections.

POMPEOPTERA MIRANDA, *var. Neomiranda.*

Frühstorfer, Ornithoptera Neomiranda, "Societas Entomologica, Zurich," t.c. p. 57 (1903); "Osthalfte Sumatra," p. 1903 (1903).

This splendid insect may be worthy of full specific rank. It is a much larger form than the ♂ of Miranda, and though the anterior wings closely resemble those of the latter, their great size, more rounded apex, and the adnervular yellow rays, with the distal yellow mark of the cell differentiate Neomiranda from *Miranda*. But in the posterior wings we observe greater differences. The wings have a stronger, bolder appearance, the submarginal (or admarginal) border of black is wider and more strongly denticulated than in Miranda, and altogether there is a strong suggestion of its specific difference.

♂. Anterior wings deep velvet black, with an appearance or suggestion of a bluish tint: but this is so faint and fugitive as to completely elude any definition of it. In *Miranda* the violet tint is easily seen in a proper light, but here we have a strong black which we know must have a violet blue mingling, though the eye is unable to find that tint.

The veins, except the median, are almost invisible, being hidden by the velvety black, except where they pass through the yellow rays; the adnervular rays extend from the inner angle to the 2nd subcostal nervule, and are longer than in Miranda: these are all yellow and graduated into a dull grey towards the outer margin, and uniformly subdued by brown scales; a small area of the same colour is at the distal end of the discoidal cell, and the terminal of the central pseudoneurus.

Posterior wings: very rich golden yellow, with prominent black veins; base of wings black; the submarginal (or admarginal) dark border broad, especially towards the anal angle, with long dentations or lunations interiorly, and with the outline of the wing also deeply dentate or lunate: this border is violet black, like the black of the anterior wing; the interior marginal fold is also purple black. A delicate hairy fringe flows from the base over the yellow of the cell and submedian area.

Undersurface of anterior wings as above, except that undefinable sheen of the black, is rather more seen, and the yellow rays and yellow end of the cell are not subdued by the brown scaling.

Undersurface of posterior wings as above, except that the yellow is slightly richer, and the admarginal dentate black border is slightly narrower than above—the apices of the dentations of the upper surface appearing through as green apices above the black of the undersurface; the costal, sub costal and basal areas of the wings black; the interior or abdominal margin black, light sienna, and with a burnt umber fringe.

The hind or outer margin is nearly straight, with white fringe lunules: the interior margin is also nearly straight. Length of abdomen or antennæ 35 mms. [In the example before me the antennæ are too short, having been broken and glued on again.] Length of thorax with head 23 mms.

Head, antennæ and thorax black; eyes nitid brown; abdomen golden yellow, with a dorsal burnt sienna stripe; anal valves buff white.

Length of costa 90, of outer margin 63, and of inner margin about 45 mms; greatest length of posterior wing 63, and width about 40 mms.

Habitat, W. Sumatra, (Frühstorfer).

In the Tring Museum.

Genus SCHOENBERGIA, PAGENSTECHER.

Section PHALÆNOSOMA, Rippon.

The characteristics of Mr. Rothschild's well-named Sch. Chimæra are so clearly differentiated from all other known species of Troides, that it seemed justifiable to me to assign it a position in a new section of the genus Schoenbergia. And though, *prima facie*, a casual examination of the ♂ would not suggest any particular departure from the general appearance of other species of the genus, a more careful study would prove its very unusual or remarkable character. No one would be likely to overlook this fact in the ♀, any more than they would in the case of the ♀ of *Ornithoptera Lydius*.

The following is the diagnosis of the sectional characters of Sch. Chimæra.

♂ Anterior wings. Costa not so gracefully arcuate as in *Titan* or *Paradisia;* the anterior angle more rounded; the wing rather larger in proportion to the posterior wing than in the general species of the genus; broader in proportion also; the exterior margin somewhat incurved along its length [in *Titan*, *Goliath*, &c. (except *Paradisia* and *Meridionalis*) it is nearly straight]; the interior margin deviates irregularly from the nearly straight line of all the other species except *Meridionalis*; the green areas of the upper surface are three in number. In all the other species they are only two, though these species differ very much from each other in other respects. From the base of the wing long hairs may be seen by an oblique examination. Posterior wing near the anal angle very concave; all other species are without this incurvature except slightly in *Goliath*. The entire area of black from the abdominal margin inward is covered with long black hairs standing above the velvety black, and curved forward in one direction; the abdominal-marginal fringe is also moderately long. The thorax is not only of the usual densely black appearance, but is also furnished with a multitude of long fine black hairs, which proceed from every part of it, as on the wing. The abdomen on its subdorsum is furnished with yellow fringe-like scales from every articulation, quite unlike what obtains in any other species. The abdominal marginal fringe is long, but scanty.

♀ Posterior wings larger in proportion than the anterior. Both wings in some undefined way unlike those of other Ornithoptera; undersurface of the anterior wings with the row of submarginal marks all fringed with long white scales. The fringe lunules on both wings and surfaces are moth-like. The posterior wing on the upper surface at half way from base to end of the cell clothed with long hairs, and when viewed obliquely, are seen to be raised high above the dark brown surface of the wing; the abdominal-marginal fringe fairly long and dense. The thorax is broad and moth-like, with a multitude of long black hairs starting from all parts of it; abdomen very moth-like, each joint widely banded with fringed-black scales, which rise above and below the body, as do also the yellow ones.

The whole aspect of the ♀ is that of a moth—the body suggesting a Sphinge, and the thorax a Bombyx.

SCHOENBERGIA (PHALÆNOSOMA) CHIMÆRA.

Troides Chimæra, Rothschild, "Novitates Zoologicæ," Vol. XI, p. 311 (1902).

♂ Anterior wings deep velvety black, with 3 extensive areas of golden emerald green. The first commences at 1-4th of the wing length from the base as a thin line running parallel with the subcostal vein to the apical angle, but broadens out in its course to the 5th subcostal nervule, being intersected by the 4th s-c nervule and divided into two parts at the outer margin, the inner edges and one small posterior portion of the green above being rather heavily shaded, and the area midway richly golden; the 2nd area commences on the median nervure at the base as a narrow curved band at halfway of which it unites with the large irregular striped discal area which transversly occupies a position of the spaces between the median branches and a little below its 4th; this area extends to within a little of the posterior margin, and is graduated into black at all points by green atoms, and within the green by black scaling: there is also a small patch of black scaling between the 3rd and 4th median branches; the 3rd is a narrow band extending parallel with the interior margin, nearly to the posterior angle.

Under surface rich golden green beautifully shaded; the costa and upper part of the discoidal cell, and a small patch intersected by the discocellular vein, deep black; a transverse discal band of black costal veins; a marginal black border commences at the base of anterior angle, being curiously indented by green along its course, becoming very broad as it reaches the apical or anterior angles—and exclusively at this part a rather long thin green line.

Posterior wings: The central area of wings (including the cell, the subcostal, and the greater part of the disc) silky golden yellow, enclosing between the 2nd discoidal and 1st median nervules a small black spot contained within a green circle; the remainder of the wing (with the exception of a narrow outer marginal band and the broad submedian area of black) is golden emerald green—graduated into the black by green atoms; a transverse row of three subtriangulate black spots parallel to the outer margin; the base is black; there is also an interior marginal short green stripe near to the base; the abdominal fringe is sienna colour.

Undersurface as above in general arrangement of pattern and colour, but the yellow area is indescribably golden, changing with light and position into dark silky ochraceous shades; the costal and outer margins with only a black outline; the abdominal marginal and part of the submedian area is pearly rufous grey; all the rest of the wings golden green, except a black triangulate submedian spot, a few costal black scales, and a transverse row of three subdiscal black orbicles. A green round spot, edged with black, is situated between the 2nd discoidal and 1st median nervules in the yellow area.

Head: Antennæ black; eyes nitid rufescent; thorax velvety black, with a multitude of long black hairs; the small red pectoral patch concealing the breathing organs is of this shape; the legs black and strong; abdomen yellow with broad lateral black marks on each segment, and on the underside each segment is outlined also with black; the usual triangulate black mark on the upper side of the anal segment; the subdorsum with yellow fringe scales, as described in the diagnosis of the Section on page 121.

Length of antennæ or abdomen 76 mms.; of exterior margin 55 mms.; of inner margin 40 mms. Greatest length of posterior wing 49 mms.; greatest width 36 mms.

Length of Legs.	1st	pair:	femur,	9;	tibia,	10;	tarsi,	13 mms.
	2nd	,,	,,	11;	,,	14;	,,	15 ,,
	3rd	,,	,,	11;	,,	13;	,,	16 ,,

Length of abdomen or antennæ 35 mms.; of thorax with head 21 mms.

♀ Anterior wings dark velvety brown; discoidal cell with a subdiscal nearly transverse, irregularly shaped white patch, subdued by dark grey atoms; a transverse row of eight ochraceous white marks more or less uniform, and varying in size from a small spot below to the largest between the 2nd and 3rd median branches—one spot is stained brown. A second subdiscal transverse row starts from near the interior angle, and curves irregularly up in an inward direction to near the subcostal vein, almost close to the 1st spot of the first row, and furthest from the apical and outer margin—these are grey-white, tinged with blue, and subdued by scaling, and are imperfectly sub-hastate or cuneiform, and of varying size; a slight congeries of white scales on the interior margin at the end of the interno-median nervule; the marginal lunations are prominently white and fringe-like, like those of a moth.

Undersurface very much as above, except that the light marks are larger and creamy white, more determinate in shape. The 2nd discal transverse row has all its marks edged most prominently with white fringe-like scales, giving a moth-like appearance to the wings; and there are three streaks of similar scales in the spaces enclosed by the 3rd, 4th and 5th subcostal nervules. The fringe lunules as above.

Posterior wings: From the base to the distal end of cell with 3-4th of the submedian, and one half of the costal and subcostal areas, very dark brown; the disc is ochraceous white, shaded towards the outer margin more and more deeply with bluish grey; midway of this large area is a transverse curved band of large orbicular black spots, 7 in number—the 7th or submedian united with the general dark area, and distorted in shape. Below the orbicles are internervular lunate shades of yellow beneath the blue grey—the whole subdued by a clouding of grey atoms; a moderately broad marginal band of black lunations; a small white spot at the distal end of the cell; the fringe lunules white and scaled, moth-like. The abdominal fringe fairly long and dark.

Undersurface as above, except that the white and yellow parts are pure—the yellow being aureolin in colour and the precostal cell white. All the discal veins are very delicate.

Head: Antennæ black, moderately stout; eyes rufous brown, underlined with white; thorax above densely black with a multitude of long, mothlike hairs (viewed obliquely); with the usual pectoral red marks; the legs stout and prominent; abdomen yellow, broadly banded with black at each articulation—occupying more space than the yellow; the black and yellow consist of long hair-like scales extending even outside the outline of the body, giving it much the appearance of the abdomen of a Sphinge moth or that of an *Antheræa*. When the butterfly is examined in the right position, it is found to be partly covered with long hairs, as may be seen by my diagram on the supplementary plate L.

Length of abdomen or antennæ 35; of thorax with the head 23 mms. Anterior wing: length of costa 99 mms.; of exterior margin 70 mms.; of interior margin 45 mms.; Posterior wing: greatest length 74 mms.; width 45 mms.

Length of Legs	1st	pair:	femur,	9;	tibia,	10;	tarsi,	11 mms.
	2nd	,,	,,	14;	,,	15;	,,	15 ,,
	3rd	,,	,,	14;	,,	12;	,,	17 ,,

Habitat: Owgarra north of the head of the Aroa River, British New Guinea. Discovered by Mr. Meek, to whom we are indebted for the sending of a multitude of the most beautiful species of butterflies and moths that have ever enriched our collections. New Guinea and its adjacent islands certainly furnish many of the most wonderful and beautiful insects and birds in the world. Among the lepidoptera we may mention those of the lovely genus *Delias* of the *Pieridæ*; and a large number of Bombyces, Geometridæ and Pyralidæ. Indeed N. Guinea is a wonderland in its productions. I am indebted to my friends Mr. H. Grose-Smith and Col. Rimington for the pleasure of figuring and describing this wonderful form; but I at first was able to closely examine several fine examples, with the types, by the kindness of its first possessor, the Hon. W. Rothschild, who discovered a ♀ in a lot of common or well-known things in papers, just at the moment when he had almost abandoned the hope of finding anything that was new to him. Soon after this he received from Mr. Meek a number of examples of both sexes, to the delight of himself and all Naturalists.

THE GEOGRAPHICAL DISTRIBUTION OF THE TRIBE TROIDES.

PART II.

Stretching away from about 4° 8′ of South Latitude, where the most Southern point of Borneo (the 2nd largest island in the world) commences, to about 18° 35′ North Latitude, (where we find the Babuyan Islands) extends a mass of more or less interrupted land, which, from its appearance must, at some period of the earth's past history, have been a large continent at least 1,440 miles in length, and quite 600 miles wide at its widest from West to East. It is possible that it may have been double that width, for its most westerly point commences at about 109° East Longitude, near the Burong Isles on the West Coast of Sarāwak, and its most easterly, about 130° 30′ East Longitude on the East Coast of the island of Mindanao. This (now theoretical) area of land includes the immense island of Borneo on the West side, the Balabac Straits and islets, the peninsula-like island Palāwan, and its offshoots Kalamon, Busuango, Koron Islets, Mindoro Straits and Mindoro, Lubang and the West Coast of the large Philippine Island of Luzon, of which Manilla is the chief port, and the Babuyan Islands; while on the East we have Borneo, the Sulu Archipelago curving away farther and farther eastward, then with an inclination north-west to Samar, still westing more and more till the Philippines again terminate on the East Coast of Luzon at its most northerly point. In other words this area includes the whole of Borneo, the Sulu Sea and Archipelago, and the Philippines.

This is one of the richest zoological regions on the globe, and its productions are almost incalculable in number. The land shells of the Philippine Islands number probably nearly 400 species and 12 genera, generally large and beautiful; the fluviatile species found by the late Hugh Cuming were more than 100. Borneo must supply over fifty species of land shells belonging to at least 9 genera, besides multitudes of fresh water univalves and bivalves—besides these, there are also the productions of the Sulu Archipelago. The Coleoptera of the Philippines, though perhaps not so large as some of those of Borneo, furnish us with many beautiful things, notably the glorious species of *Pachyrinchidæ*, most of them like living jewels. The birds are sufficiently numerous, and among their number are many most beautiful species. The same may be said of Borneo.

Among the numerous lepidoptera of this immense region the Ornithoptera are well represented, though perhaps not quite so well as in the New Guinea regions. In Borneo we have *Amphrysus* and its varieties *Rufi-* and *Flavicollis*, *Rhadamantus* (*or Nephereus*), which is a native of Mindoro, Mindanao, and Luzon; *Plateni* in Palāwan, also *Magellanus* in Luzon, East Mindanao, Babuyanes, Polillo; *T. Brookeana* at Sarāwak in West Borneo, Kina Balu, North Borneo, &c.; *T. Trojana*, a still more beautiful representative of the genus, is peculiar to Palāwan; *P. Helena*, v. *celebensis* is found in Borneo; *P. Miranda* in Sarāwak and Sandakan, (North Borneo); *P. Andromáche* at Kina Balu and *P. Cerberus* in the Natuna Islands.

With respect to Borneo, its northern portion appears to be the richest in Ornithoptera, of which two Genera are found. This area of the island is about 24,000 square miles in extent, completely surrounded by the sea except to the south and west. The coast line is extremely irregular, over 600 miles in length, with several good harbours. The Kina River is navigable for a distance of 200 miles by large steam launches. Kina Balu, or the Chinese Widow, rich in butterflies, many of them very fine species, is 13,700 feet high, and belongs to a mountain range which extends south westerly, with few interruptions, to about 1° 0′ north latitude, where its height is from 3,000 to 4,000 feet at Batang Lupar. The north-west headland at the north extremity of the island consists of the red sandstone cliffs of Pulu Balhalla, which rise perpendicularly to a height of 600 feet or more. In their many caverns the nests of *Collocalia Linchii*, the edible Swallow, are abundant. Behind this cliff, however, low flat land stretches in every direction, and indeed probably down the west side of the island parrallel to the long mountain range spoken of above, and also along the coast to Sandakan Harbour in Labuk Bay, and eastward to Labuk. Elopura is on the north-west shore of the bay, and the harbour has an entrance 1 mile wide, varying in breath from 3 to 10 miles along its 16 miles of length. The river Sigalind is a large one debouching at the head of the bay, 16 miles from Elopura, and winding west and north-west, lined for miles with mangroves, followed by Nipa Palms, the huge forest trees, and tangle of vegetation rising to the height of 200 feet on each side of the river, which narrrows more and more to its source. Many of the trees are 150 feet high, their summits merging in those of others by dense masses of creepers, which spring from the branches and overwhelm them; the roots of the trees are strengthened by buttresses smooth and flat of corresponding size, which support the stem for 30 feet from the ground. High up in the branches the bird's nest fern *Neottopteris* sp., Elk's Horn Fern, *Platycerium* sp. and orchids abound: and also the cobalt-blue Irena, Fruit-eating Pigeons, Hornbills, the Racquet-tailed Drongo shrike, *Dicrurus brachypterus*, [a member of the *dicrurinæ* or double tailed birds, which is not a shrike at all, but a Wood or Forest Swallow, (a beautiful group of moderate sized birds spread over a large portion of the globe, from India and the eastern islands to Australia)], is also found. This species is blue black, with a head crest which bends back over the neck, and the two outer tail feathers, more than twice the length of the others, are naked throughout the greater part of their length, or from 12 to 14 inches, then again webbed so as to form a spatulous terminal—each of the feathers from its naked portion describing a most graceful curve.

Sarāwak, another part of Borneo, where fine Ornithoptera abound, situated 1° 40′ North Latitude, and about 109° 50′ of East Longitude, is at the Northern portion of the island on the west side, which bulges out very much westward,

with an enormous bay at the head of it extending north and north-east to Cape Sirik. This bay receives the inland waters of the River Lupar, which has it sources somewhere near the Saribu-Saratus Mountains, and the 3,000 or, 4000 feet high Batang Lupar Mountains. Mount Padang, 3,200 feet, Pontianak and the Great Kapua River, which with a trend n-north-east extends inland an immense distance, are some of the prominent parts of this western portion of Borneo. Hereabout is found *P. Miranda* (as well as in North Borneo); while an allied species *P. Neomiranda* inhabits Western Sumatra, an island more western still: and *T. Brookeana* is found in both East and West Borneo and Sumatra, and along its western coast.

Although there are lofty mountains in Borneo as we see by a map, many of them have been, and may be still, volcanic, the greater part of the island is so low and flat as to suggest the idea that in a comparatively recent period, it has sunk, as Mr. Andrew Murray has said, so as to have been an impassable morass, when it was separated from the great Asiatic Continent.

Altogether, Borneo is a rich zoological region, and the extent of its wealth in animal life certainly cannot yet have been nearly ascertained, to say nothing of its flora, and the revelations which a more extended knowledge of its geology may bring to the notice of its students and explorers. Our knowledge of its insects will probably result in immense additions to our lists when all the mountainous districts of the interior, especially in the south, have been fully examined. So that there is yet work for years to come. The same probably holds good with regard to birds, of which over 400 species are known, of which 90 are peculiar, belonging to 124 genera—a significant indication of the possibilities of its avifauna. Among these are 3 Woodpeckers, 4 Kingfishers, 4 Goatsuckers, 2 Owls, 1 Sunbird, 6 Pittas, 7 Pheasants and 2 Partridges. The insects and shells furnish a large number of peculiar forms. The mammals number at least 82 species—66 of them arboreal, and few, if any, terrestrial—9-10ths of this number being peculiar to the island.

The wealth of Sumatra must be nearly or quite as great, considering that 330 Birds are known to exist, (including the crimson-breasted Trogons and the Argus Pheasant) : and among the Mammals 12 Monkeys, 10 Bats, 8 Cats, 9 Squirrels, 2 Rats and 1 Swine. According to Murray, who quotes from Müller's "Verhandlungen" (1835) the whole number of Mammalia then known was over 70 species, distributed among 38 genera—since then it is uncertain how many have been added to the list.

The Philippine Archipelago consists of a group of 29 larger or smaller islands, besides a very large number of very small islets and rocks, followed south-westward by the crowd of small islands called the Sulu Archipelago. The largest of the Philippine group are Luzon, Mindoro, Panay, Samar, Leite, Negros, Sebu, Bohul, Mindanao (or *Magindano*), and the western island of Palāwan. The forms of some of these are most remarkable, especially of Luzon and Mindanao, giving a coast line for each of immense extent, compared with its actual size, just as the case is with the more eastern island of Gilolo; and when one comes to carefully examine and study the chart of this remarkable group, one cannot escape the conviction that other forms of Ornithoptera, and new localities for those already known may yet be discovered in the intricate mazes of the archipelago, in spite of our fairly extended knowledge of its natural productions.

The flora of the Philippines as at present known, according to Mr. R. A. Rolfe of Kew, consists of 2,108 species of Dicotyledonous Plants, belonging to 723 genera; and 1,340 Monocotyledonous species belonging to 273 genera. The ferns number 497, of which 52 are peculiar to the Archipelago; there are also 200 timber trees.

The island of Celebes is as peculiar in form and extensive coast line as are some of the Philippines. On the eastern and western sides a system of mountain chains runs nearly north-west and north-east, sinking to the sea level in the south, but joined northwards to the high chains of the Sussua and Tobungku Mountains respectively. A trench-like depression between them is partly occupied by a vast swamp, Lake Opa, which is drained by the large river Konarveha, which, rising in the north, breaks through the eastern range to the Bay of Sampara. Mount Bowonglangi is one of its most important mountains, situated in the Eastern portion of the south peninsula near Boni: is 6,500 feet high: is steep and composed of erruptic rock, but with no sign of a crater. The most northern point of the island commences at 2° 15′ N. latitude and about 124° 57′ E. longitude; while the most southern commences at S. latitude 5° 35′, and E. longitude about 120° 30′. The whole island consists of a central area of considerable extent, with four long peninsulæ branching off s-south-east, n. and north-east, the northern being the largest, the north-east the shortest, and the south-eastern the most indented by bays. There is a narrow southern extension produced by the island of Salayer, divided by narrow straits from the mainland, running south to the extent of 48 miles, and not more than 8 miles wide; at the south-eastern peninsula terminal are also 4 important islands, namely Kabaena due south, Muna and Buton south and s-south-east, and the small island of Wawoni, east of the peninsula, and north of the last two. To the east of the shortest peninsula is the curiously formed island of Peling, with a group of smaller islands and islets, which extend away east to Taliabu and Mangola. A considerable portion of this island's peninsulæ is mountainous, especially southward, and the western portions are much more extensively intersected by rivers than the eastern, where the rivers are few. The Ornithoptera of Celebes are *P. Haliphron*; *P. Hippolytus*, v. cellularis; also the type form; *P. Hephæstus*, and *P. Helena*, v. leda. The latter is found in the island of Salayar together with *Haliphron*, *Bauermanni*, and *Hephæstus* the latter also occurring on the east portion of the south-eastern peninsula. *Haliphron*, *Cellularis*, *Hippolytus*, type, and *leda* inhabit the extreme south; and *cellularis* and *Hippolytus* type are found, as we should expect, in the islands of Muna and Buton. The Butterflies of Celebes are very numerous. The Mammalia are only 16 in number

—all terrestrial; the Birds furnish about 202 species or more, of which 194 species are indigenous to the island. Among the birds and butterflies are many belonging to the Himalayan types, though not found in the adjacent islands. Among the former are 3 species of Orioles, 3 Wood Swallows, 6 Crows, 9 Sun Birds, 13 Kingfishers, 2 Hornbills, 3 Nightjars, 26 Pigeons, 7 Owls and 21 other Raptores, 6 Pheasants, and 16 Parrots and Cockatoos.

Sula island, east of Celebes, is really a peninsula, consisting of the two islands Taliabu and Mangola, divided by an extremely narrow strait, Sula Besi, south of Mangola, and the islet Lisamatura. The type form of *P. Hippolytus* is found there, and also in Sula Besi.

Sumbawa, East longitude about 117° 30′ and South latitude about 9° 20′ is one of the smaller islands following Java, in the remarkably rich volcanic belt of which Sumatra is the first and Timor the last, situated north, south, and south-west of Borneo and west and south of the Malay Peninsula. This island is 170 miles in length and about 50 in width. Its dry season is from April to July, during which so little rain falls that many of the rivers fail altogether, and tke Sumbawa River is then about a foot deep of clear water. In the north-west part of the island is the terrible volcano Tambora, with a crater 8 miles in diameter, which is 9,000 feet high. At the east end of the island is Bima (Bay) a narrow inlet running north and south for 15 miles. Every little cove of this inlet is beautified with coco palms, though the country itself is so dry. To the west is a range of mountains 5,800 feet high, which shuts in the inlet. The island is almost divided in two by the Gulf of Salee or Sumbawa, from north to south-east; the island Moyo is at its head, and several smaller islets are situated down its eastern course, such as Danga, Ngali, and Rakit. Along the south and west coast it is pierced by many rivers: on the south coast is Mount Dodo 3,937 feet; and north-east of Dodo is Mount Rapang 4,100 feet high. At the extreme east on the south coast are two islands, Sido and Tenfgam; while west of these is Tiempia inlet, running about 12 miles to the north, and fed in the wet season by two rivers running north-west and north-east, the latter 20 miles long. North-east of the east end of the island and a few miles away is the mountain island of Gunong Api or Sangeang, 6,040 feet high. The western parts are divided from Lombok by Allas Strait. *P. Helena* var. propinquus, is found on this island; also the type form of *P. Naias*, v. sumbawana, and its variety Socrates. Among the birds may be mentioned the Lemon-crested Cockatoo, *C. Sulphurea; Tropidorhynchus timoriensis* (a uniformly dull brown species with bare neck and face), a Golden Oriole; *O. Broderipi*, the Malayan Goatsucker, *C. Macrurus*; the Ashy Tit, *Parus cinereus*, 2 species of nightjars; *Pachycephala stigmatops*; species of the genera *Geoffroyus* and *Z. osterops*, a small Woodpecker *Yungipicus grandis* of Hargitt; and a Bush-tongued Lory *Trichoglossus Forsteni*, &c. Over 40 species of birds were taken by the collectors of the Marchesa Expedition. Zoographically Sumbawa is entirely different from Java and the other great Malay islands.

The islands of Java and Sumatra form a great ridge of volcanos and volcanic mountains more than 1,460 miles from north-west to south-east, its greatest width over 210 miles, and its least 37 miles; its greatest height 15,000 feet, midway of Sumatra. In the group of islands of which these two are the chief, the most terrible outbursts of volcanic fury recorded in history have at different times occurred, compared with which the displays of Etna, Vesuvius, Stromboli, Kirauea in the Sandwich Islands, Mexico or S. America, are very minor affairs. Nevertheless these islands are rich and beautiful; and whether considered from a geographical, physical or zoographical point of view are of the deepest interest, enhanced by the fact that, as Mr. Wallace shows, Java's fauna differs from that of its neighbours Sumatra, Borneo, and the Malay Peninsula, more than they do from each other, and have close resemblances to the Siamese Peninsula and also to the Himalayas, which Borneo and Sumatra do not exhibit.

The Ornithoptera of these two islands are fairly numerous. We have two genera represented in Sumatra and one in Java. *Trogonoptera Brookeana* inhabits the south and south-eastern part of the latter island; but its metropolis is Borneo—while the other members of the genus are in Palāwan. *Pompeoptera Vandepolli* is found in Java, and its black variety *Honrathiana* in Sumatra; *Amphrysus* in west and south Java; its variety *Sumatrana* in the Battak Mountains, in East Sumatra and at Karo, in the same island; the variety *cuneifera* in West Java, Mount Gede, Preanjer, Ardjoana; its variety *Palabuana* at Palabuan, south-west Java, *Pompeus* in Java (this is the analogue, or rather the Javan form of *Cerberus*); *Hycetus* in Java; *Cerberus* in Sumatra; and *Neomiranda* in Western Sumatra. The Bird fauna of Java furnishes 270 species—40 of them peculiar to the island—belonging 25 genera. These comprise Jays, Gapers, Bee-eaters, Woodpeckers, Cuckoos, Hornbills, Parrots, Pheasants and Partridges among the larger forms; its mammals number 90 species belonging to about 44 genera; (but some of these have been introduced, and a few are doubtful.) They include 5 or 6 Monkeys, nearly 40 Bats, 5 Cats, 9 Squirrels, 2 Swine, 2 Rats and 2 deer. In Sumatra there are 12 Monkeys, 10 Bats, 8 Cats, 9 Squirrels, 2 Rats and 1 Swine; and the whole number of Mammals is over 70 species, distributed among 38 genera. The Lepidoptera and Coleoptera are very numerous in both islands, and many of them very splendid; the other orders also supply many striking forms, especially among the Orthoptera.

The Phanerogamous plants are 9,000 in number; and among the most remarkable productions are the Pitcher plants, *Nepenthes*.

Of Bali and Lombok, the two islands between Java and Sumbawa, and of the islands, Flores, Pantar, Wetta and Timor all east of Sumbawa, and of Sandalwood Island south of Flores, little may be said. *Haliphron* is found in Pantar and Lombren, in South Flores at Samanger, and in Wetter; *Nais* in Pantar, Lombren, Flores and Sumba.

On the west coast of Borneo are two groups of small islands, the north Natuna group, about 3° 50′ N. lat. and 107° 20′ E. long. ; and the South Natuna group about 2° 50′ N. lat., and about 109° 0′ E. long. The largest of the North Natunas are Pulo Laut and Bunguran, and of the South Natunas Subi, Panjung and Sirhassen. In Balabac, one of the islets, *Brookeana* occurs, which perhaps is not surprising, considering that the South group is not more than 64 miles north-west of the coast of Sarāwak. The other species found in the northern group are *Cerberus* and *Andromache*.

P. Darsius is confined entirely to the island of Ceylon ; being found in the western-central provinces, all the year round : emerging from the pupa in March and April. It is not uncommon in the open woods, and may be often seen flying in pairs. The ♀ rises slowly and vertically into the air, the ♂ soon follows her in the same direction and in in the same style of flight, the two remaining about two or three feet apart, where they keep on rising and falling in perfect unison, as if they were under a magnetic spell. Occasionally a second or a third ♂ is drawn under the same influence, and compelled to follow the same mysterious leading under a similar excitement or exaltation. The species is found on the plains and hills, whether in forest or open ground. Its flight is very high. At Kandy the species is very common, also at Galle : abundant in the low country, but in the hills is to be met with as high as 4,000 feet. This is the only species of Troides inhabiting Ceylon, though about 29 other species of Papilioniinæ belong to the island, and a large insect fauna in addition—estimated by Tennant at 10,000 species. The Birds of Ceylon would probably number quite 350 ; the reptiles over 120 ; the mammals 70 species. Of the physical character of the island there is no need to speak ; it is so well known.

We now come to the great Indian region, exceedingly rich and abundant in species of insects, of birds, and indeed of all orders of animal life. But as any even brief description of its various provinces would require more space than this volume could afford, and so much information at any rate, of a geographical description, is possessed by everyone, I will only say that in this region we will suppose to be included the Andaman Islands, Cochin China, Siam, Cambodia, the Tenasserim provinces, Burma, Arakan, Chittagong, Assam and Khasiah hills, Sylhet, Sikkim, Nepaul, Bhotan, South India and the Western Himalayas ; an extent of land maintaining an enormous fauna and flora of the most varied, wonderful and splendid character in every order—probably not yet much more than half known—a region extending, say, from 70° to 110° of E. long., and from 49° to 10° of N. lat., or about 5,529,600 square miles ; and if we add to this the Chinese region in which Troides may be found—(at least as regards *Pompeoptera Cerberus*) this immense area would be greatly enlarged, still more so by the addition of the Malay Peninsula. Over all these regions only the Pompeoptera are to be found, though a few more forms of that genus may yet be met with.

It therefore remains to give a summary of the foregoing, as I have done in Vol. I. of this work.

SUMMARY OF THE FOREGOING.

Trogonoptera Brookeana	Borneo; Sarāwak, Sandakan, Benjermasin, Perak, Labuan Bedager, Marabuk River (N.B.), Ipo (Perak), Kina Balu, Lawas, Mount Muru (N.B.), E. Sumatra, Johore (S.), Deli (S.E.S.), Kopras (N.E.S.), Quala Lemœruk (N.E.S.), Malay Peninsula, Balabac (Natuna Isles).
,, *v. Eleanor*	Sumatra.
,, *v. Albescens*	Malacca.
,, Trojana	Palāwan
Pompeoptera Hippolytus, The type	Amboina, Ceram, Gilolo, Morty Island, Sula Island, Celebes, Bara Bura, Ilu (Ceram), Mira (Morty Island), Tawaya N. of Palos Bay, Lompa Battav (S. Celebes), Sorontalo (S. of Palos Bay), Sula Besi, Sula Mangola.
,, ,, *v. Celebensis*	Celebes.
P. Hippolytus *v. Sulaensis*	Mangola Island.
,, ,, *v. Cellularis*	Toli Toli (N. Celebes).
Pompeoptera Minos	Darjiling Shivaroy Hills, Buxa, Malabar, Trevandrum, Bombay, Nilghiri Hills, Travancore, Tenasserim, S. India, Cannanore, Assam, Karwar, China, Sumatra, Rangoon, Bankok.
Pompeoptera Darsius	Ceylon, Western Central Provinces, Kandy, Peradeniya, Havagama, Belitualoya, Velverry, Trincomali. [March, April.]
,, Vandepolli	W. Java.
P. Vandepolli, *v. Honrathiana*	Mount Battak (Sumatra).
P. Haliphron	S. Celebes, Samanger (S. Flores), Lombren, Pantar, Adonara, Alors, Wetter, Salayar, Celebes, Macassar, Djampea Isle.
,, ,, *v. Bauermanni*	Laroae, Patuna (S. Celebes) [August to Jan.]
,, ,, *v. Pistor*	Djampea Isle, Kalao Isle
,, ,, *v. Pallens*	

Pompeoptera Naias	Kayeli, Adonara, Pantar, Lombreu, Flores, Sumba, Sumbawa.
,, ,, *v. Sumbawana*	Sumbawa.
,, ,, *v. Socrates*	Wetter, Alor, Adonara, Sumbawa.
,, Iris	Letti, Mou Isle. [July to December].
,, Staudingeri	Selaru, Loeang Isle, Babber, Damma, Segra (Timor Laut.)
,, Plato	Patadala, Sumba, Sumbawa.
,, Criton	Batjan, Gilolo, Morty, Dodingo, Ternate, Halmahera, Batyobroas, Mira.
,, ,, *v. Felderi*	Batjan.
,, ,, *v. Oberthüri*....	Batjan, Mira, Morty Isle.
,, Critonoides	Oby or Obi.
P. Riedeli	Larat (Timor Laut), Tenimber. [In June].
,, Amphrysus	W. and S. Java, Malay Peninsula, Labuan, Penang.
,, ,, *v. Sumatranus*	Battok Mountains, Sumatra, E. Sumatra, Karo.
,, ,, *v. Cuneifera*	W. Java, Mt. Gede, Preanjer, Ardjoana.
,, ,, *v. Palabauna*	Palabuan S.W. Java.
,, ,, *v. Olympia*	S.E. Borneo.
,, ,, *v. Flavicollis*	Borneo.
,, ,, *v. Ruficollis*	Malacca, Nias, Sumatra, Borneo.
,, ,, *v. Niasicus*	*Nias
,, ,, *v. Vistara*	**Tanna Massa and Poelo Tello, Batu Islands.
P. Helena	Ceram, Goram Laut, Great Banda, Kayeli, Bouru, Java, Celebes, Amboina, Saparua.
,, ,, *v. Carolus*	Dutch N. Guinea.
,, ,, *v. Pluto=Rutilans*	North Tambora, Java.
,, ,, *v. Jupiter*	Java.
,, ,, *v. Propinquus*	Sumbawa.
,, ,, *v. Celebensis*	Borneo, Salayar, Minahasza, Banda.
,, ,, *v. Bouruensis*	Bouru.
,, ,, *v. Papuensis*	Port Moresby, Stephansort, New Guinea.
,, ,, *v. Papuanas*	Stephansort (N. Guinea), Constantinhafen.
,, ,, *v. Melpomona*	New Guinea.
,, ,, *v. Leda*	Salayar.
,, ,, *v. or ab. Grose-Smithi*	New Guinea.
,, Æacus	Cochin China, Assam, Darjiling, Bengal, Cachar, Tavoy, Sinbyoodine, Sikkim [May to October], Chin Lushai, Khasia Hills, China, W. China, Nepaul, Moulmein, Tonking, Straits of Malacca, Burmah, Ta-tsien-lu, Shan States, Tenasserim, Masuri (N.W. Himalayas), Dacca, Saigon, Ava (Lower Burmah), Chittagong Hills, Upper Mekong, Omei Shan (W. China or Thibet), Rossel Island, Oby Isle, Siam, Chang-Yang (6,000f.), Se Pinf Lou, Chan (Ya Tcheon), Ya Chin Loo, Ichang, Wa Shan, Mou Pin, Meplay, Thaiping, Muong Snow (Shan States), Gudwal, Selango, Perak, Siam, Kwala Lumpar, W. and Central China [May to October.]
Pompeoptera Æacus (*contd.*)	
,, ,, *v. Formosana*	S. Cape (Formosa).
P. Nereis	Engano.
,, ,, *v. Propinquus*	Engano.
P. Cerberus	From Sikkim to Assam Cherrapungi, Burmah, Sumatra, Banguey, Penang, Borneo, Lombok, Nias, Andaman Islands, Beeling, Upper Tenasserim, Bhutan, Maguac (Burmah), Poungador (U. Burmah), Khasia Hills, Darjiling, Kurseong, Bengal, Malacca, Natuna Isles, Banquey Isles, Padang, Karen Hills, Malay Peninsula.
,, ,, *v. Heliconoides*	Port Blair and Little Brother Island, (Andamans).
,, ,, *v. Pompeus*	Java.
P. Hephæstus	S.E. Celebes, Salayar, Bonthain, Bantimœrong, Pampanga, Portiero, Luzon.
P. Rhadamantus	Luzon, Mindanao, Mindoro.
P. Plateni	Palāwan (Philippines).
P. Dohertyi	Salibobo (Talautse Islands).
,, ,, *v. Fasciculatus*	Talautse Islands.
P. Miranda	Sarāwak, Sandakan (N. Borneo).
P. Neomiranda ♂ †....	Western Sumatra.
P. Hycetus ♀	Java.
P. Andromache	Kina Balu (N. Borneo).
,, ,, *v. Marapokensis*	Mount Marapoke (N. W. Borneo).
P. Magellanus	Luzon, E. Mindanao, Babuyanes, Polillo (all Philippine Islands).

The foregoing list represents all the localities that have come under the author's notice ; but many more will probably be found on the labels attached to specimens in different collections ; and special ones can always be added by the student to the maps found in the body of this work.

* Frühstorfer.

** Ibid. The name *Vistara* is evidently adopted from the "Lalita Vistara," a highly embellished expansion of the early biographies of Buddhaghosha of Ceylon, the author of "The way of Purity," written about 400 A.D. Mr. Lathy describes this *var.* of Amphrysus, "Adnervular markings of anterior wing greyish white instead of yellow ; marginal black border of posterior wing as in *Niasicus* of Frühstorfer."

† The ♀ was discovered too late for figuring in this volume ; but will be published in a supplement to follow Vol. II. Mr. Lathy's description is as follows : "♀ darker than ♀ of *Miranda* ; upper adnervular whitish markings extend to cell, and yellow markings of h-w. larger ; underside as above ; on underside the cream coloured lunules larger than in *Miranda*."

Lathy, "Trans. Ent. Soc." pp. 1, 2 (1907.)

Additional Localities of Species and Varieties belonging to Vol. I., and also to New Species or Varieties Discovered since that Vol. was Completed.

Schoenbergia Titan	Kapa Kapa, British New Guinea, Aroa River.
Sch. Goliath	Geelvink Bay, Dutch N. Guinea.
Sch. (Phalænosoma) Chimæra	North end of the Aroa River, British New Guinea.
Sch. Paradisea, *ab. auriflua*	Kaiser Wilhelmsland.
,, ,, type form	Constantinhafen, Binga (German N. Guinea), Finisterre Mountains.
Sch. Meridionalis	Upper Aroa River.
,, ,, type form	Kiriwini, Fergusson Island, Milne Bay, Mailu, Brown River (N. Guinea), Kapaur.
Ornithoptera Aruana *v. Obiensis*	Oby Island.*
O. Crœsus	Batjan, Oby.
O. Urvilliana	Alu (Shortland Islands), Rendova, Kei Toeal, Salawatti, Ysabel Island, Treasury Island, Bougainville, Guadalcanar.
O. Cassandra	Little Mulgrave River, Queensland.
O. Poseidon *var. Pronomus*	Teoor, Simbang, Sorong (Dutch New Guinea), Mysol, Constantinhafen, Cooktown (Queensland).
O. Poseidon	Fergusson Island, Engineer Group, Milne Bay, Mailu, Mausinam (Dutch N. Guinea), Kapaur, Aru, Tenimber, Kei, Djampier Isle.
O. Pegasus	Simbang, N. Guinea.

The Solomon Island Lepidoptera are distinctly Malayan in type, closely allied to those of the eastern Archipelago, some of them only island forms, modified by long isolation ; but the members of the genus Ætheoptera are exceedingly distinct in type from any found in Malaya, and though superficially they seem to be closely allied to those of the New Guinea genus Schoenbergia, are yet only distantly related to them. The island of Guadalcanar is one of the most fertile and beautiful islands of the group according to Woodford, who spent some time there in collecting and studying its productions, and is rich in bird and insect life—many species of the different orders being peculiar to it, notwithstanding the fact noted above. Its length is about 80 and breadth 30 miles. The highest mountain summits reach 8,000 feet, and there are numerous peaks over 4,000 feet high. The rainfall, over 100 inches per annum in the east, and possibly much more still in the mountains, is responsible for the existence of numerous rivers, some of them of considerable size. An alluvial flat composed of fertile soil extends for 25 to 30 miles along the centre of the north coast of the island, with a varying width of from 5 to 10 miles. The depth of the sea between the Solomons and New Guinea reaches over 2,000 fathoms, and the highest point of land being as much as 10,000 feet in the island of Bougainville, gives therefore a range of 22,000 feet from the bed of the sea to the summit of the island. The group contains at least 17 species of Bats, 6 of them peculiar to the islands, the others being also found in the Duke of York group, though the latter islands are separated by over 100 miles of this deep sea from the former.

Of the birds there are many species closely allied to those of New Guinea and its neighbouring islands ; but there are no birds of Paradise yet discovered. Of the Parrots some of the species are peculiar to the Solomons, such as the Cardinal Lory, *Lorius Cardinalis* ; the pigmy parrots of the genus Nasiterna, among them *N. Aola*, the smallest known. Among the other special species is a Cockatoo *Cacatua Ducorpsii*, a Hornbill *Rhitidocerus plicatus*, several species of large fruit Pigeons, Carpophagæ ; Green and Ground Doves, many species, a Megapodius or Mound Builder, *M. Brenchlayi*, many species of Kingfishers, Flycatchers, Herons and Raptorial birds. Among the Reptiles are 17 Lizards, of which 7 are not found out of the Archipelago. The Lepidoptera of these islands other than Ornithoptera are numerous. There is a considerable number of Papilios—each island having its own special forms, including *Pap. Orsippus* of the Ulysses (blue and black) group, and also the Sarpedon, Codrus and Ægeus groups. The Pieridæ are not numerous in species or individuals ; Danaidæ are plentiful ; Euplœas common in the forests, and in the foliage fringing the seashore. Almost every island has its own species, as might be expected. The genus Hypolinmas is well represented and has many mimics, so are the Nymphalidæ generally. There are very few Satyridæ, but among them are 3 or 4 species at least of the little butterflies belonging to the exquisitely beautiful genus *Argyronympha* ; and 2 species of Xois, a genus peculiar to Fiji ! Lycæna are plentiful, and Gela Isle is specially rich in beautiful species—some of the less showy ones swarm in every situation. There are very few Hesperidæ, but moths are very abundant. The Trobriand Islands, SS.-E. of the extreme south point of New Guinea, together with several other groups of islets near at hand, and where *O. Aruana* and one or two other Ornithoptera are found, consist a vast number of low, thickly wooded islands covered with a prolific under growth of trees and shrubs and cocoa palms ; and are densely populated by natives who exquisitely carve and design their canoes, and make beautiful

* Oby Island with its islets has apparently never been inhabited, as it is supposed by the natives of other islands to be haunted. Fishermen for a few days each year encamp there, but no one stays any longer than necessary.

ornaments. Indeed, they are in those respects born artists, and are a much finer and more advanced race than the Papuans. These islands furnish a vast number of beautiful species of Lepidoptera, especially moths of many families.

The headwaters of the Aroa River (in British N. Guinea) which debouche in the north of Redscar Bay, are lined by extensive forests. This river is formed by the junction of two main branches, the Kabuna and Veida. The latter reaches the mountains forming part of the Owen Stanley Range ; and the country at this point is inhabited by a much more intelligent and energetic race than that of the coast. Mount Manaku to the east is over 6,000 feet in height. The Kabuna river runs through a mountainous country. The whole country eastwards is filled with rugged mountains, in narrow parallal chains. About this district is the habitat of *Sch.* (*Phalænosoma*) *Chimæra*. Above this district up to 6,000 feet the vegetation consists chiefly of Cedars, Pines, Tree Ferns, Oaks, &c. Many species of Birds of Paradise are found here. For interesting information respecting other parts of New Guinea such as Geelvink Bay to Mac Cluer Gulf, Humboldt Bay and German New Guinea from Astrolabe Bay the reader will find much that is valuable and instructive in the following works :—" P. E. Moolenburgh, Tijdschrift van het Nederl, Aardijksk, Genootshaft No. 2 ;" " Bijdragen tot de Taal-Land-en Volkenkund van Nederlandsche, Indié, 1902, Nos. 1, 2 (The man of war Ceram Officer's report)." The journal of the Berlin Geographical Society, No. 3, 1898, with Dr. Lauterbach's account of his successful exploration of the interior of German New Guinea in 1896. The Doctor discovered and traced the course of the Ramu River—a district rich in plant and bird life. Also A E. Pratt's " Two Years among N. Guinea Cannibals " (1906) ; R. Lovett's " Tamata ; " the same author's " Life and adventures of a Christian Hero (the Rev. James Chalmers) " ; and Article and notes scattered through the later vols. of the Royal Geographical Society's Proceedings," and " Australasia," Vol. II. by F. H. H. Guillemand (in *the Compendium of Geography and Travel* of Stanford (1894).

At Momos on the south coast of the island of Waigiou, east of Chabral Bay Guillemand of the *Marchesa Expedition* in 1889 saw multitudes of *O. Poseidon* or a variety of it dashing through the woods at a fearful pace. It was here also that the smallest of the birds of Paradise, *Diphyllodes Wilsoni* was met with.

The number of species or varieties of species of Troides thus far known to exist in New Guinea (British, German and Dutch), not including the neighbouring islands, is 21. The number of Birds is 770 species, as against 500 in Australia, of which 40 are Birds of Paradise, and at least 300 are peculiar to this continent. Upwards of 400 vascular plants are also found in this immense region. Mr. Meek, by the latest of his letters, is on the track of yet another Ornithoptera probably of the Genus Schoenbergia.

LIST OF AUTHORS

WHO HAVE WRITTEN ABOUT THE *GENERA*, *SPECIES* OR *VARIETIES* CONTAINED IN THIS VOLUME, WITH THE DATES OF MENTION.

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Clerck. *Hippolytus*, 1764; *Helena*, 1764.
Cramer. *Amphrysus*, 1782; *Helena*, 1779, 1782; *Hippolytus*, 1775, 1779, 1782; *Minor*, 1779; *Pompeus*, 1775.
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CLASSIFIED INDEX OF GENERA, SPECIES AND VARIETIES.

SUPPLEMENTARY SPECIES AND VARIETIES, AND NOTES ON SPECIES INCLUDED IN VOL. I.

GENERAL INDEX.

Index to the Synonyms of the Tribe TROIDES.

For other Synonyms refer to Pages 93 to 109 of the present volume.

EXPLANATION OF THE PLATES.

Coloured Ornamental Titlepage, with figures of P. Amphrysus, v. *flavicollis*, Papilio [Ornithopterina] iphidamus, and a Lycæna.

Portrait of the Author.

PLATE.

26. Trogonoptera Brookeana, *Figs.* 1, 2, ♂, 3, 4, ♀. *var. Eleanor* ♀, *Figs.* 5, 6.
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31. ,, ,, *var.* sulaensis, *Figs.* 1, 2 ♂ ; 3, 4 ♀ Neuration of ♂ 5, 6, of ♀ 7, 8.
32. P. Vandepolli, *Figs.* 1, 2, ♂ ; 3, 4, ♀ antenna of ♂ magnified ; 1b abdominal marginal fold of ♂ ; 1c subdorsal of abdomen ; 3a subdorsum of ♀ abdomen ; 3b, 3c, neuration of ♀ ; 1d, 1e, neuration of ♂.
33. P. Vandepolli, *var.* Honrathiana, *Figs.* 1, 2, ♂ ; 2a, anal valves of ♂ ; 3, 4 ♀ ; 4a subdorsum of ♀ abdomen ; 5 P. Vandepolli ♂ ; 6 ♀ ; 7 Posterior wing of ♀ above ; 6 abnormal neuration of ♀ A.R. ; normal of left wing N.L. ; 8a,b,c, legs of ♀ magnified ; 9, 10 sections of antenna of ♀ magnified. [Plain Plate].
34. Larva of P. Pompeus, *Fig.* 1 ; Pegasus, 2, 3 ; Poseidon, 4 ; Papuensis, 5, 6 ; Pupa of O. Poseidon, *Figs.* 7, 13 ; Pompeus 8 ; Amphrysis 9, 10 ; Poseidon v. *pronomus*, 11, 12 ; Sch. Paradisea, 14 ; Front view of the mouth of the Larva of Pompeus, 15. [Plain Plate].
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36. P. Riedeli, *Figs* 1, 2 ♂ ; 3, 4 ♀.
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38. Map 5. E. Borneo and Celebes.
39. Pompeoptera Plato, *Figs.* 1, 2, ♂ ; 3, 4, ♀ ; 5, 6, ♀ (Felder's type) ; 7, 8. Neuration of type ♀.
40. ,, Criton *Figs.* 1, 2 ♂ ; 3, 4, ♀ ; 1a, Neuration of ♂ ; 3a of ♀ (Felder's types).
41. ,, Critonoides, *Figs.* 1, 2 ♀ ; 3, 4 ♀ ; 5 Neuration of ♀ ; 6 of ♂ ; P. Criton, *var.* Oberthüri, 7, ♀.
42. ,, Criton, v. *Felderi*, *Fig.* 2 ♀ ; Critonoides, 1, ♂ ; P. Iris, 3, *var.* ♀ ; P. Naias, 4 ♂ ; 5 ♀ ; neuration of Naias, 6 ♂ ; 7 ♀.
43. Map 6. N. Borneo from the equator, Palāwan, and the Sulu Sea.
44. ,, 7. Burmah, Siam, Cochin China, Cambodia, and Andaman Islands.
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46. P. Papuensis *Fig.* 1 ♂ ; neuration ♂ 1a ; 2 ♀ ; 2a, neuration of ♀. P. Melpomona, 3 ♂ ; neuration of ♂ 3a ; 4 ♀ ; neuration of ♀, 4a.
47. P. Minos, *Fig.* 1, 2 ♂ ; 3, 4 ♀ ; 6 neuration of ♂ ; 5 of ♀ ; and of P. Helena ♂ 7.
48. P. Helena, *Fig.* 1, ♂ ; 3, 4 ♀ ; *var.* Grose-Smithi, ♂ 2 ; *var.* Carolus ♂, 5 ; Neuration of ♀, 6.
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51. P. Ruficollis, *Figs.* 1, 2, ♂ ; anal valves of ♂, 2a ; *var.* flavicollis ♂, 3 ; ♀, 4, 5.
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55. P. Rhadamantus, *Figs.* 1, 3, ♂ ; 5, ♀ ; 2, neuration of ♂ ; 4, of ♀.
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57. P. Cerberus, *Figs.* 1, 2, 3, ♂, Darjiling; 4 ♂, U. Burmah; 6, Felder's type ♀; 8, 9, ♀ *vars.* N. India; 10, ♀ Rangoon; 7, subdorsum of abdomen, ♀; P. Pompeus 5, ♂ Java; 11, 12, ♀ Java; 13, 14, ♀, right and left wings of the same example, showing asymmetry.
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59. Ibid. *Figs.* 1 to 40. [Plain Plate].
60. Pompeoptera Darsius, *Figs.* 1, 2, ♂; 3, 4, ♀; neuration of ♂, 5; of ♀, 6.
61. P. Dohertyi, *var.* fasciculatus, *Figs.* 1, 2, ♂; 3, 4, ♀.
62. P. Plateni, *Figs.* 1, 2, ♂; 3, 4, ♀.
63. Pompeoptera Dohertyi, *Figs.* 1, 2, ♂; 3, ♂; 4, 5, ♀; 6 subdorsum of abdomen, ♂; 7, of ♀.
64. ,, ,, 1, ♂, *var.* of 1st type; 4, ♂ of 2nd type; 2, 3 ♀ *vars.* of 1st type; 7, 9, ♀ vars. of 2nd type; 5, 8, ♀ of 3rd type; 6, ♀ *var.* of 2nd type; 10, ♀ *var.* of 2nd type; 11, ♂ sexual pouch, above; underside 12; 13 neuration of ♂; 14 of ♀. [Plain Plate.]
64B. P. Iris, *Figs.* 1, 2, ♂; 3, 4, ♀; 2a, neuration of ♂; 5, of ♀.
65. P. Staudingeri, *Figs.* 1, 2, ♂; 3, 4, ♀; neuration of ♂ 2; of ♀ 3.
66. P. Neomiranda, *Figs.* 1, 2, ♂; 3 upper surface of posterior wing of ♂; 4, ♂ neuration.
66A. P. Miranda, *Figs.* 1, 2, ♂; neuration 3, 4.
66B. ,, ,, *Figs.* 1, 2 ♀.
66C. ,, ,, *Figs.* 1, 2, ♀ melanistic variety; neuration, 3, 4.
66D. P. Andromache, *Figs.* 1, 2 ♂; 3, Abdominal fold-pouch ♂; 3a, underside of the same; 4, 5, ♀; 5a, abdominal fold of ♀ upper surface; 5b undersurface; 5c legs of ♀; 6 neuration of ♀.
67. P. Magellanus, *Figs.* 1, 2 ♂ Opalescent colours; 1a, 2a Xanthochroic colours; 3, 4 Felder's ♀ type; 5, 5a, neuration of ♂.
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E. [Supplementary] Schoenbergia Titan, *Figs.* 1, 2 ♂; 3, 4 neuration, 5, legs magnified 2-1ths.
F. ,, ,, ,, *Figs.* 1, 2 ♀. O. Poseidon, *var. Hecuba*, ♀, 3.
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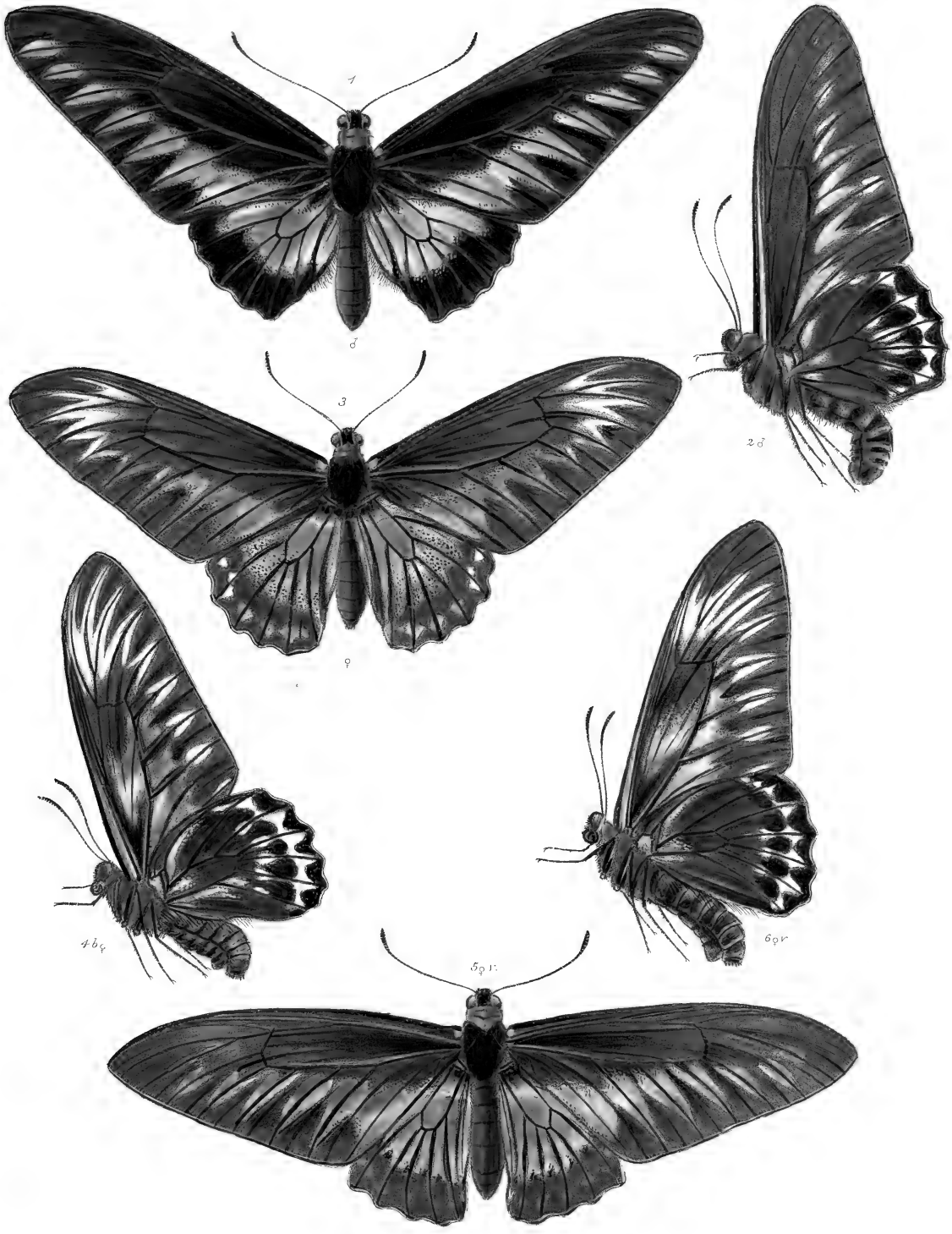
M. Ornamental Tail-piece Plate "GLORIA IN EXCELSIS DEO!"



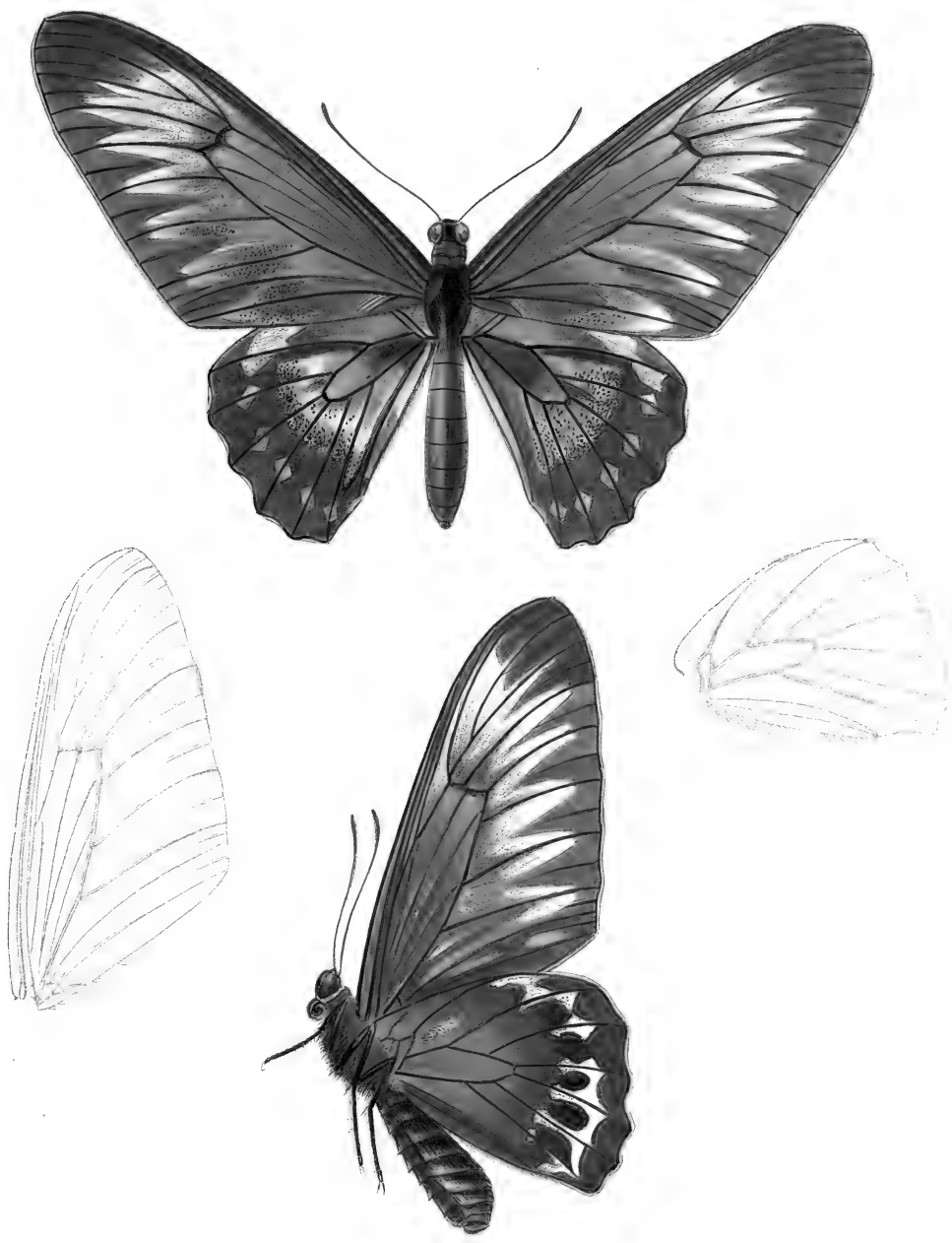
Robert H.F.Rippon del.et lith.1889.

M&N.Hanhart imp.

TROGONOPTERA BROOKEANA, *Wallace. 1,2,♂,3,4,♀,5,6,♀,var.*
Eleanor,F.A.Walker. 7,See text.

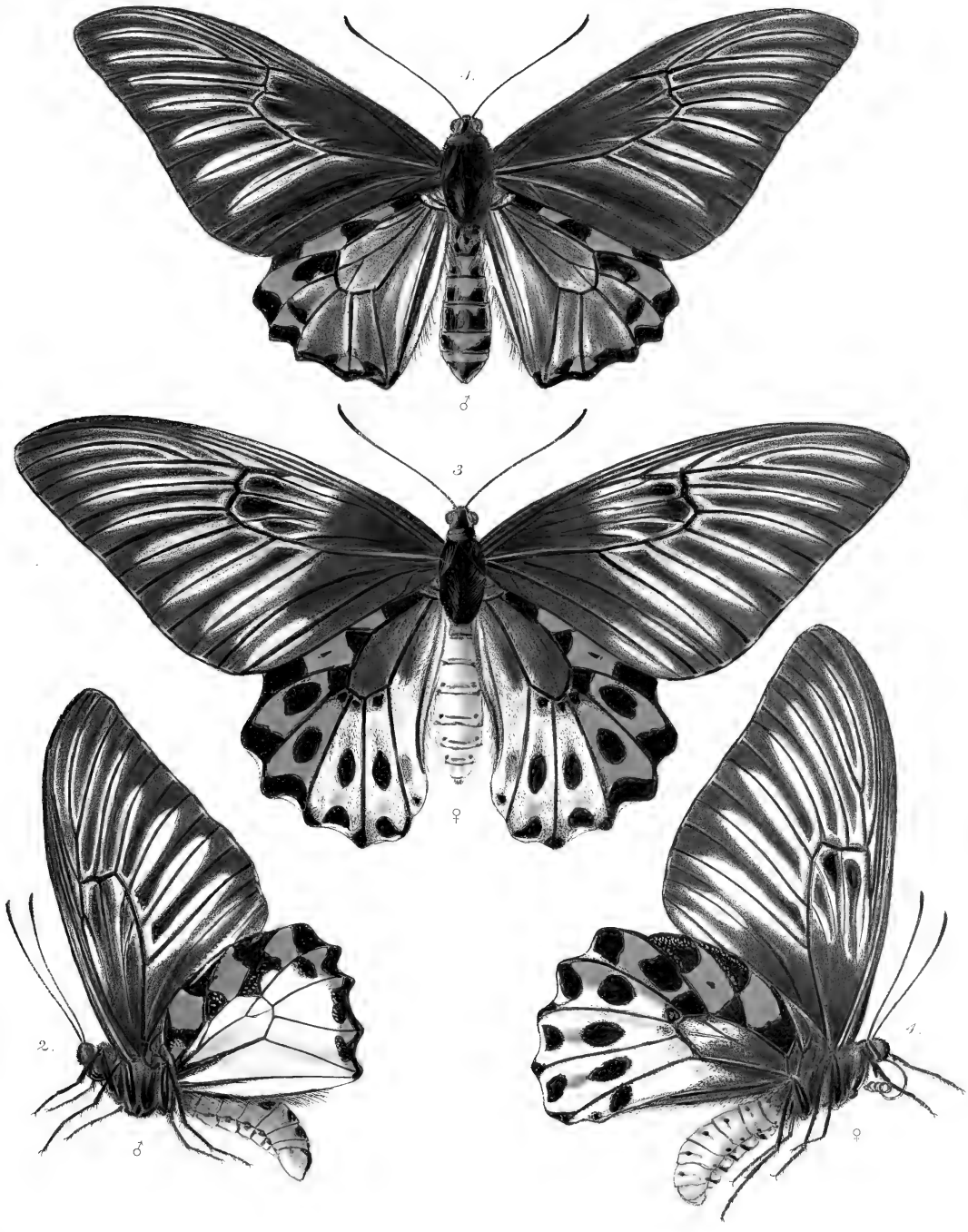
Robert H.F.Rippon, del. et lith., 1898. Hanhart imp.

TROGONOPTERA TROJANA; *Honrath*, *Figs. 1, 2b; 2a neuration;*
2b, upper, 2c under-side of abdominal fold; 3, 3a pattern of both surfaces of T. BROOKEANA



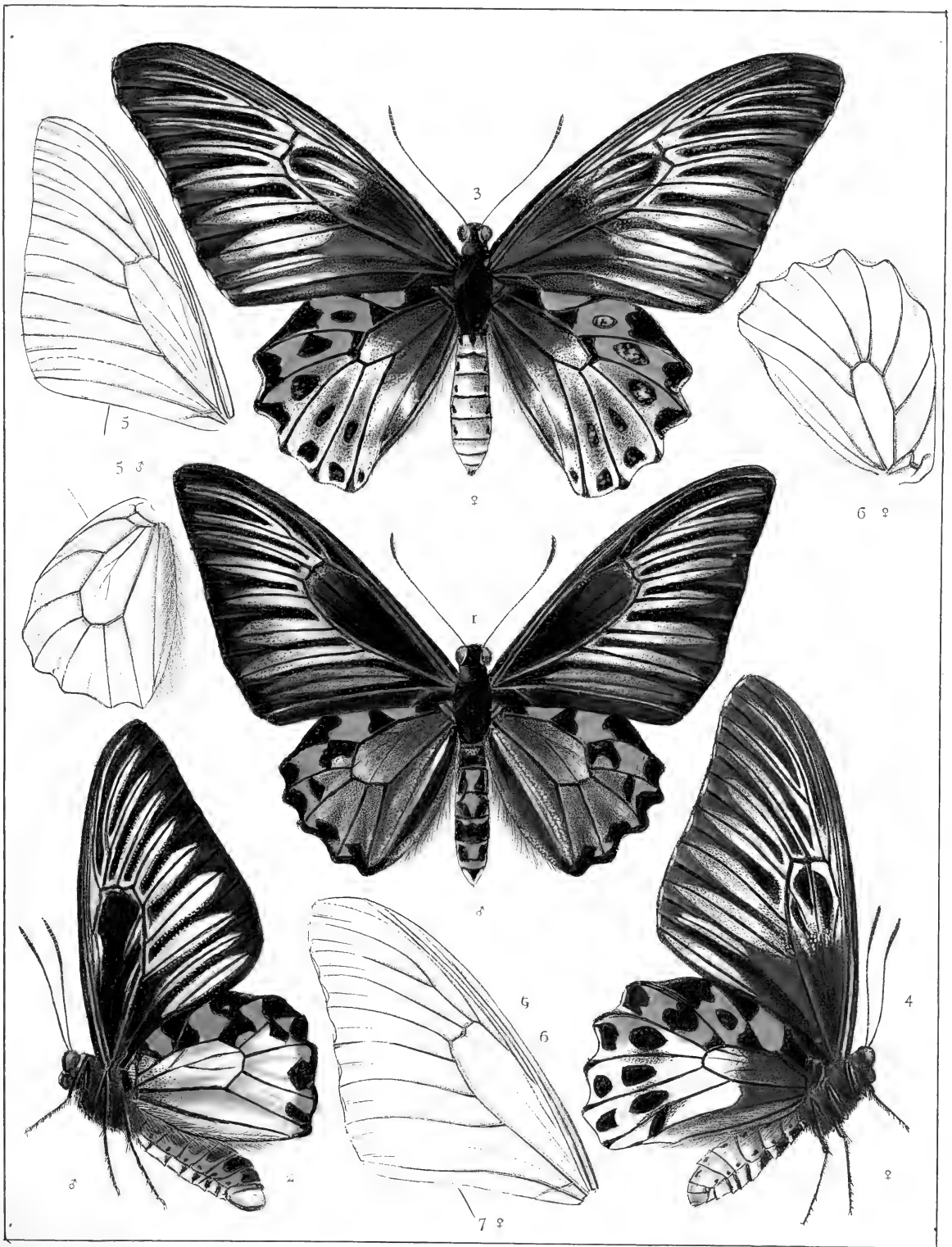
Robt. H. F. Rippon, del. et Pinx., 1901. R. Morgan, Imp.

TROGONOPTERA TROJANA, *Honrath*, ♀. *Figs. 1, 2, 3, 4.*



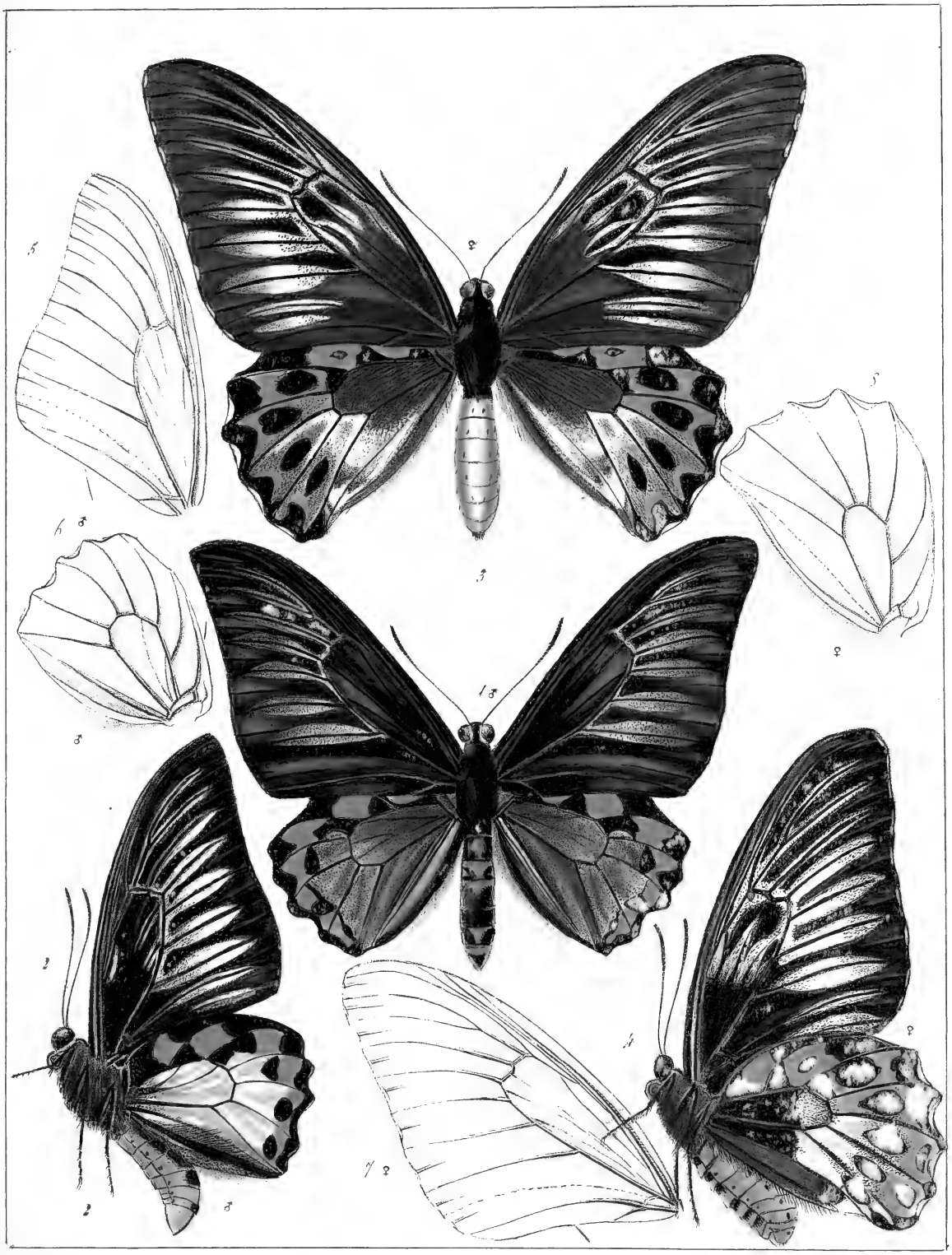
Robert H.F. Rippon del. et lith. 1889. M & N. Hanhart imp.

POMPEOPTERA HIPPOLYTUS. *Cram.* 1, 2 ♂, 3, 4, ♀



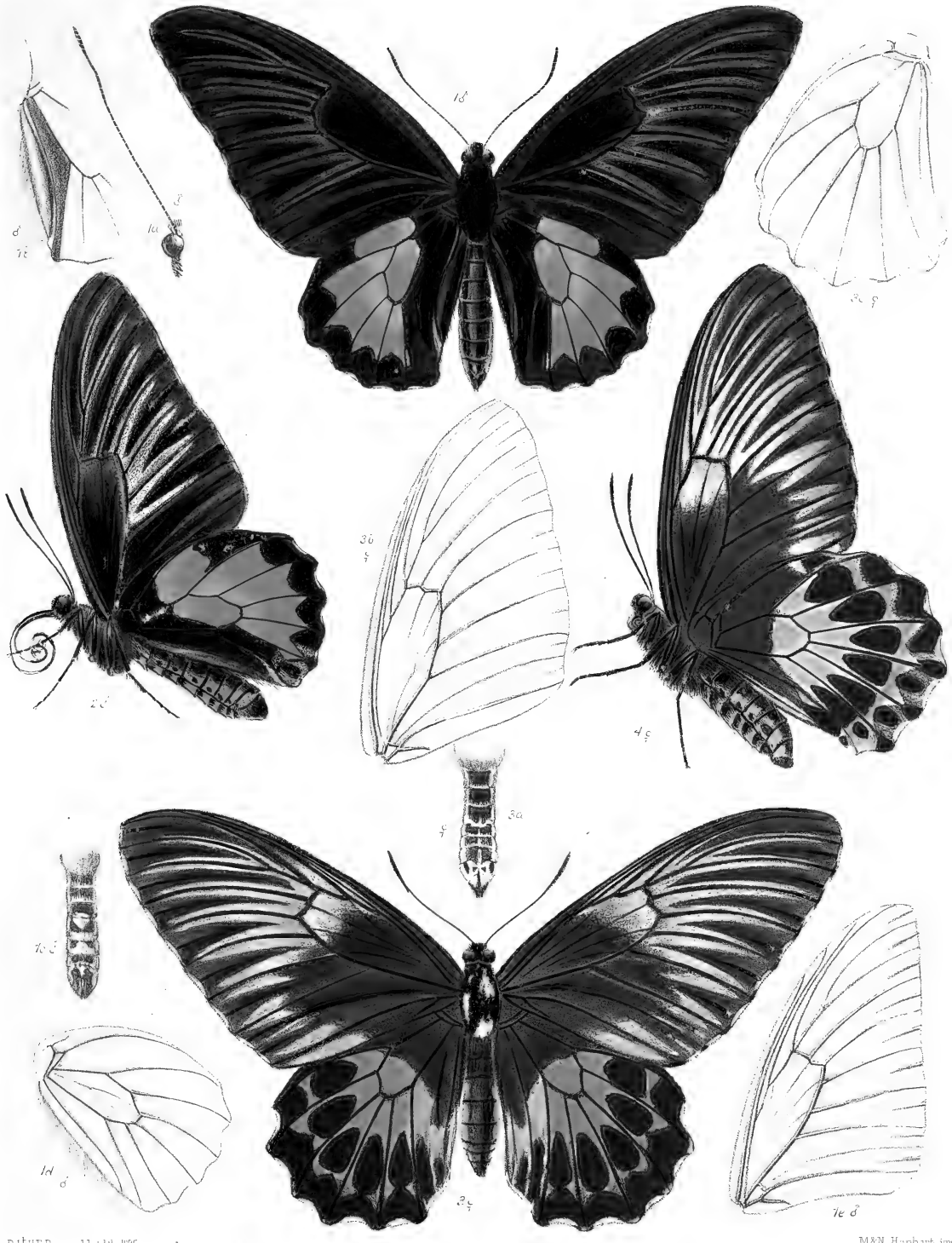
Robt. H. F. Rippon, del. et Pinxit, 1905.
R. Morgan, Impr.

POMPEOPTERA HIPPOLYTUS, *v.* Cellularis, Rothschild, *Figs. 1, 2, ♂ ; 3, 4, ♀ ; 5, Neuration of ♂ ; 6, 7 of ♀.*



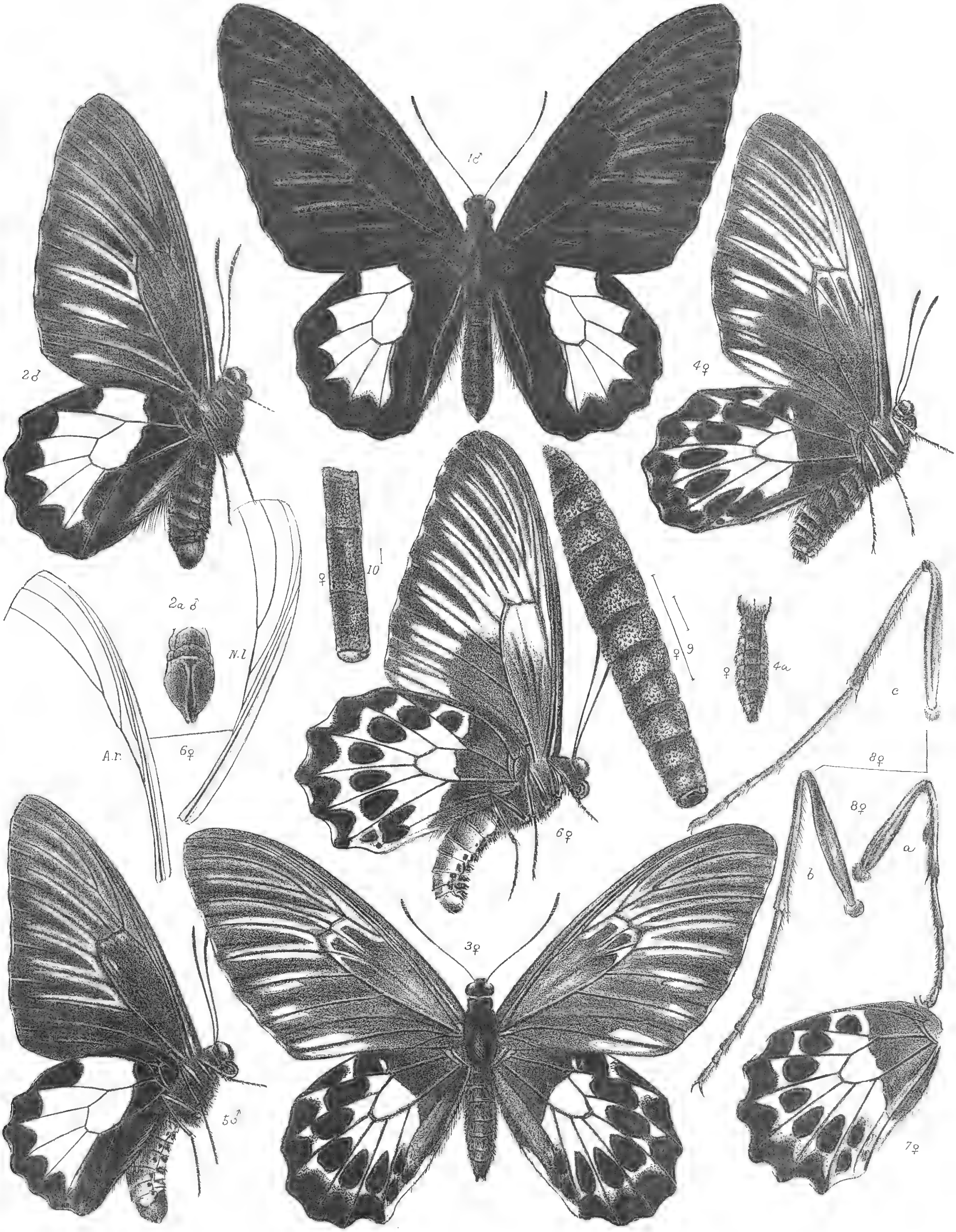
Robt. H. F. Rippon, del. et Pinxit, 1905. H. Morgan, Impr.

POMPEOPTERA HIPPOLYTUS, *var.* Sulaensis, Staudinger, *Figs. 1, 2, ♂ ; 3, 4, ♀, 5, 6, Neuration of ♂ ; 7, 8, of ♀.*



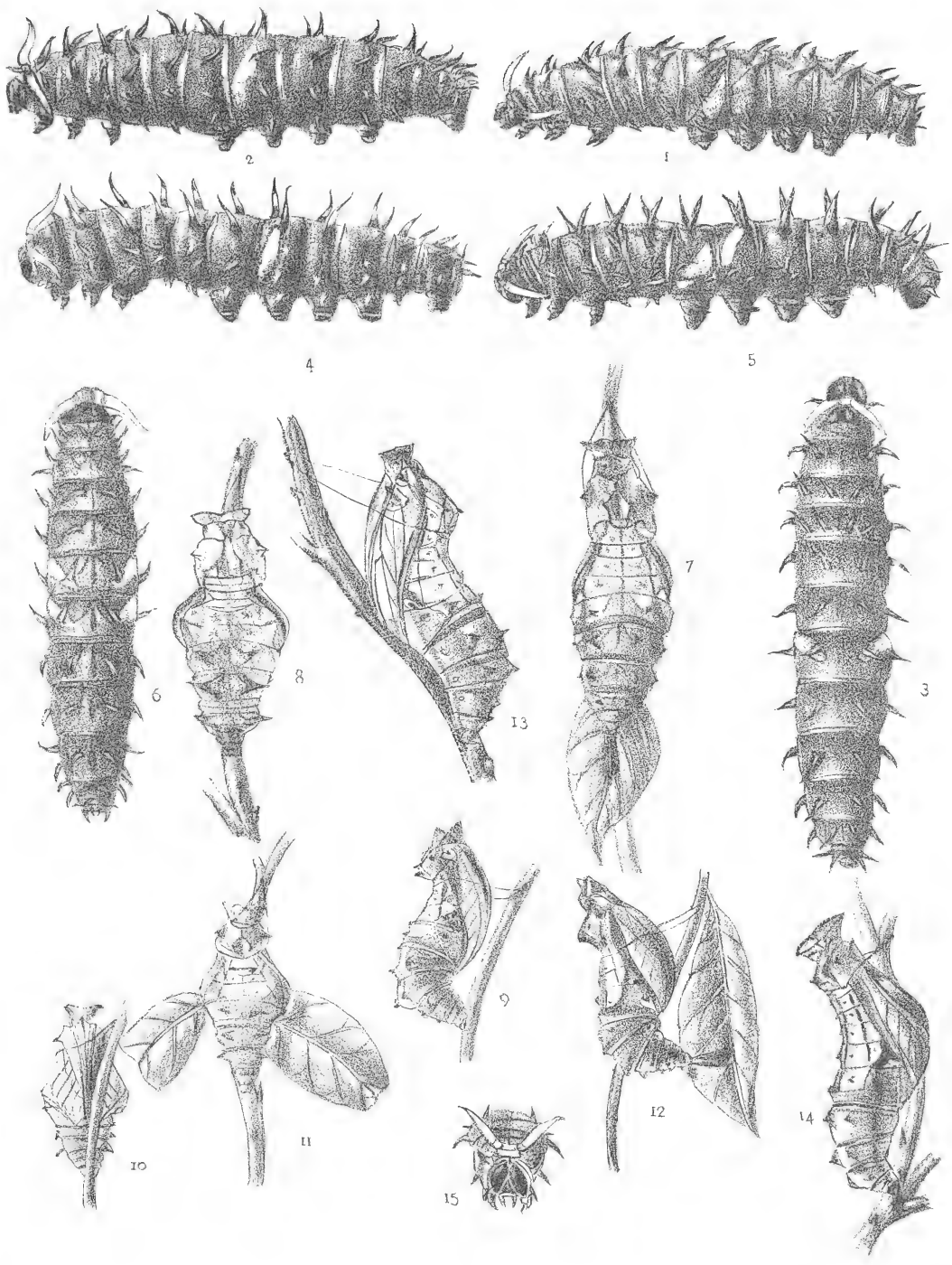
Rob.t H.F. Rippon. del et lith. 1895 M&N. Hanhart imp.

POMPEOPTERA VANDEPOLLII, (Snellen). Figs 1, 2. ♂; 1a, antenna of ♂, mag.; 1b, abdominal fold or pouch of ♂; 1c, Subdorsal of ♂ abdomen; 3,4. ♀; 3a, Subdorsal of ♀ abdomen; 3b, 3c, neuration of ♀; 1d, 1e, neuration of ♂.



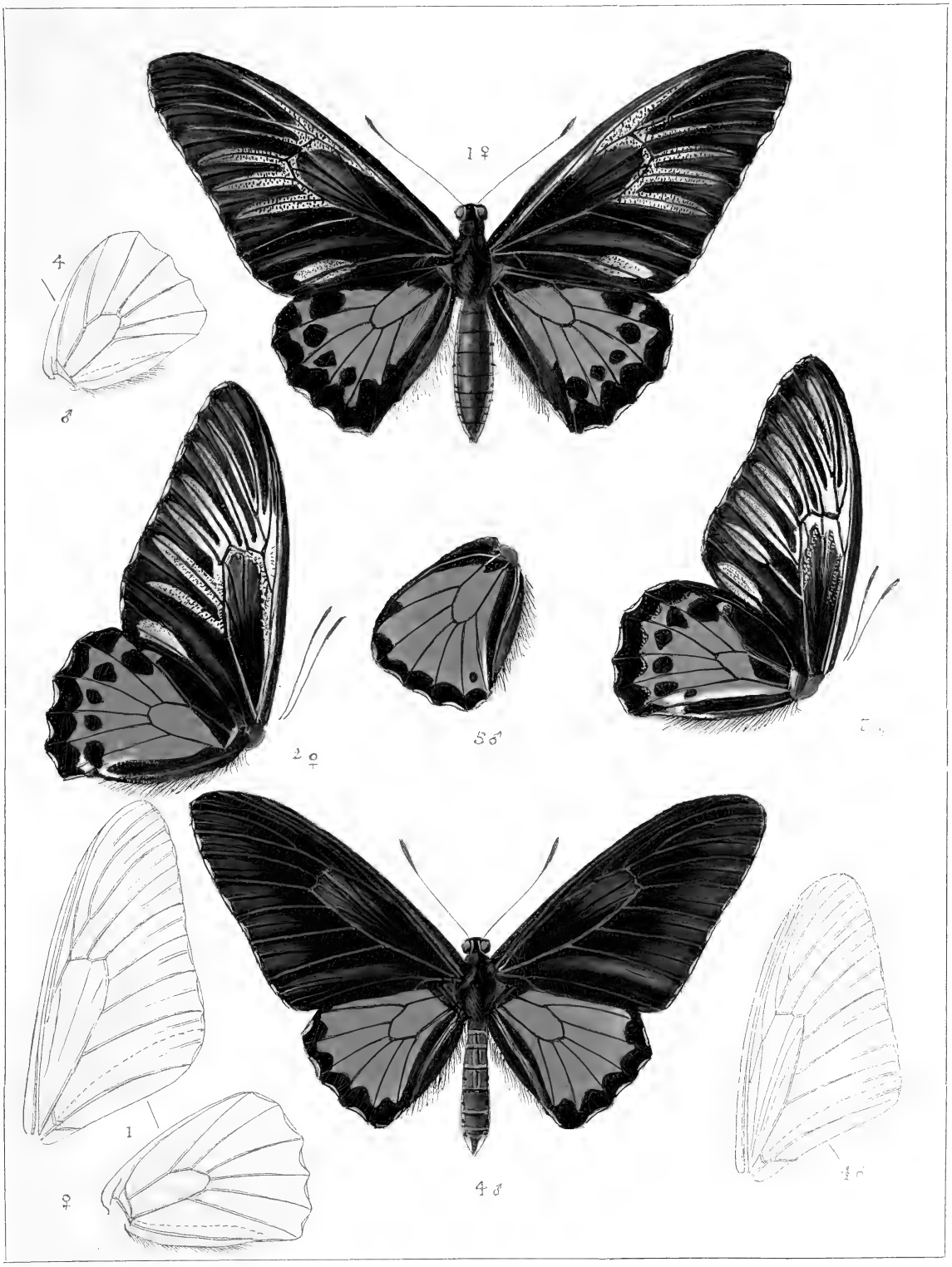
Robt H.F. Rippon del. et lith. 1895. M&N Hanhart imp.

POMPEOPTERA VANDEPOLLI, *var.* HONRATHIANA, *Martin, 1, 2, ♂; 2a, 3, an valves; 3, 4 ♀; 4a, ♀ Subdorsum of abd.; 5, P. Vandepolli, Snellen, ♂; 6♀; 7♀ Posterior wing, above; 6♀, A.r. abnormal neuration, right wing; N.l. normal of left w; 8, a, b, c, legs of ♀, mag. ♀, 9, 10, Section mag. of ♀ antenna.*



Robt. H. F. Rippon, del et lith. 1906.

LARVA of P. Pompeus, *Fig.* 1; of O. Pegasus, *Figs.* 2, 3; of O. Poseidon, *Fig.* 4; of P. Papuensis, *Figs.* 5, 6; Pupa of O. Poseidon, *Figs* 7, 13; of P. Pompeus, *Fig.* 8; of P. Amphrysus, *Figs.* 9, 10; of O. Poseidon, v. *Pronomus*, *Figs.* 11, 12; of Sch. Paradisea, *Fig.* 14.
Front view of the mouth of the Larva of P. Pompeus.

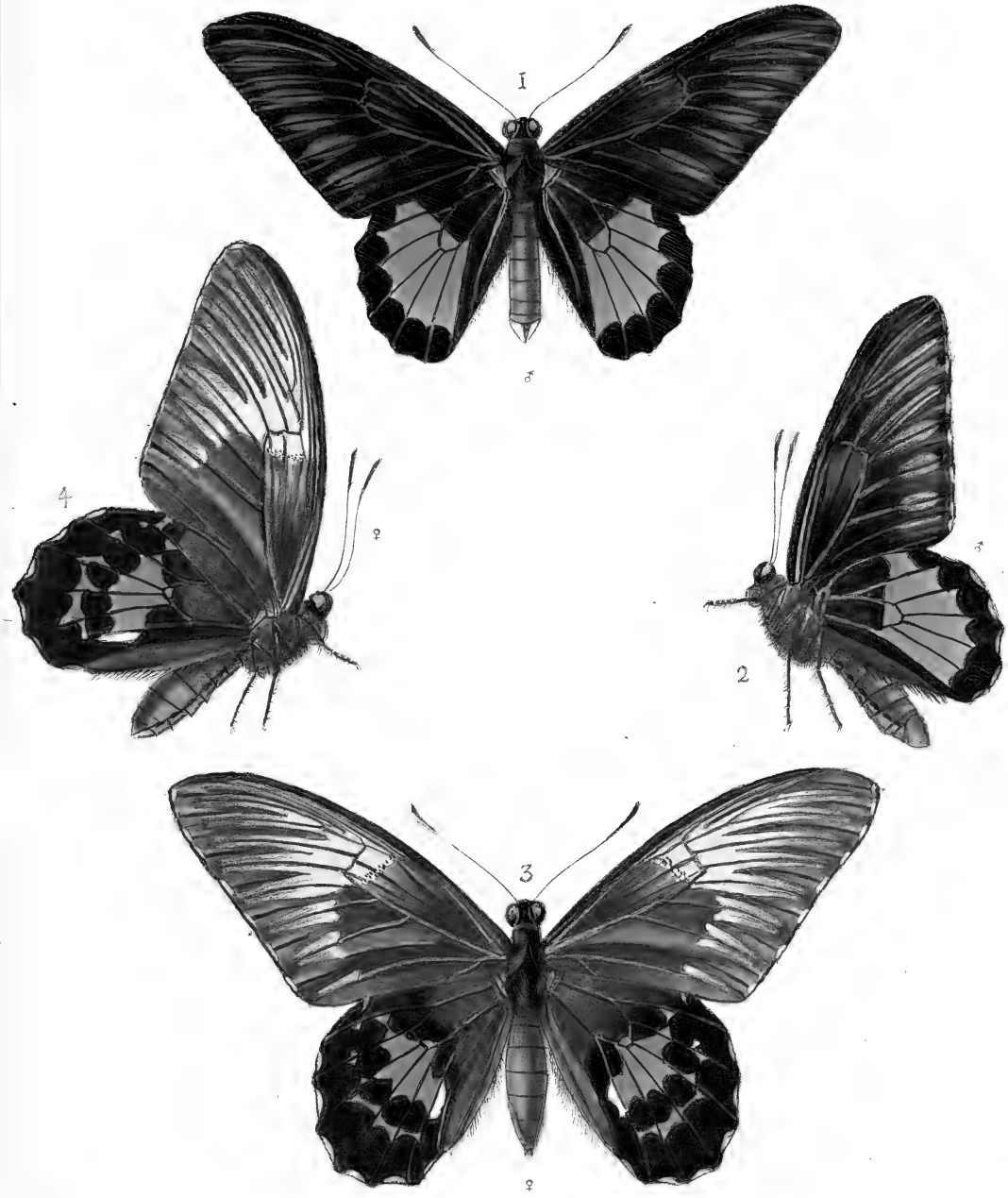


Robt. H. F. Rippon, del. et Pinxit, 1907. R. Morgan, Imp.

POMPEOPTERA HEPHÆSTUS, *Felder*, Figs. 1, 2, ♀ ; 3, outline of Felder's type, ♀ ; 4, 5, ♂ .

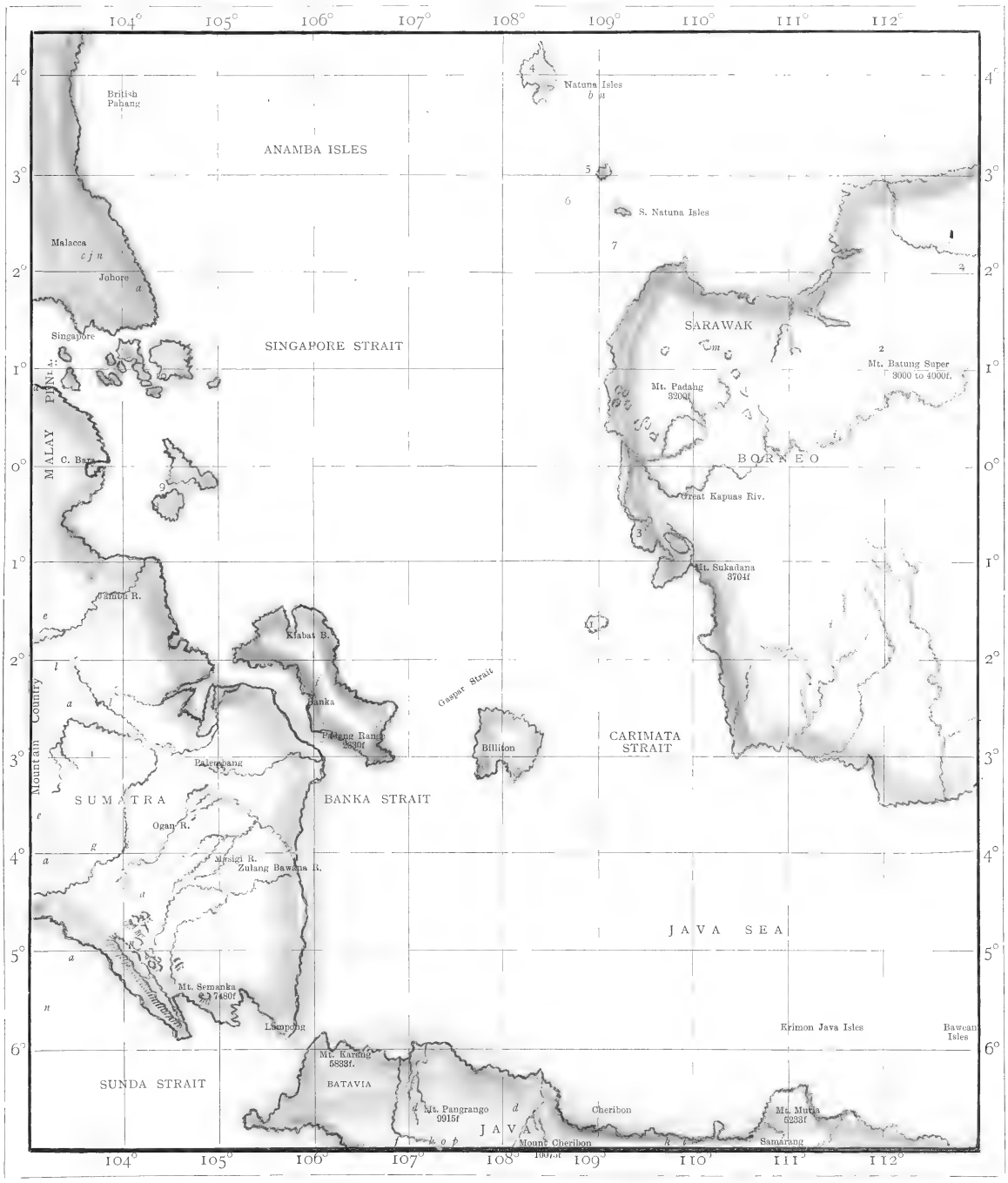
Robt. H. F. Rippon, del. et Pinxit, 1907. R. Morgan, Impr.

POMPEOPTERA ÆACUS, *Felder*, Figs. 1, 2, ♂ ; 3, 4,4a ♀, (Felder's type); 5, neuration of ♂; 6 of ♀.



Robt. H. F. Rippon, del. et Pinxit, 1906. R. Morgan, Impr.

POMPEOPTERA RIEDELI, *Kirsch*; Figs. 1, 2, ♂; 3, 4, ♀



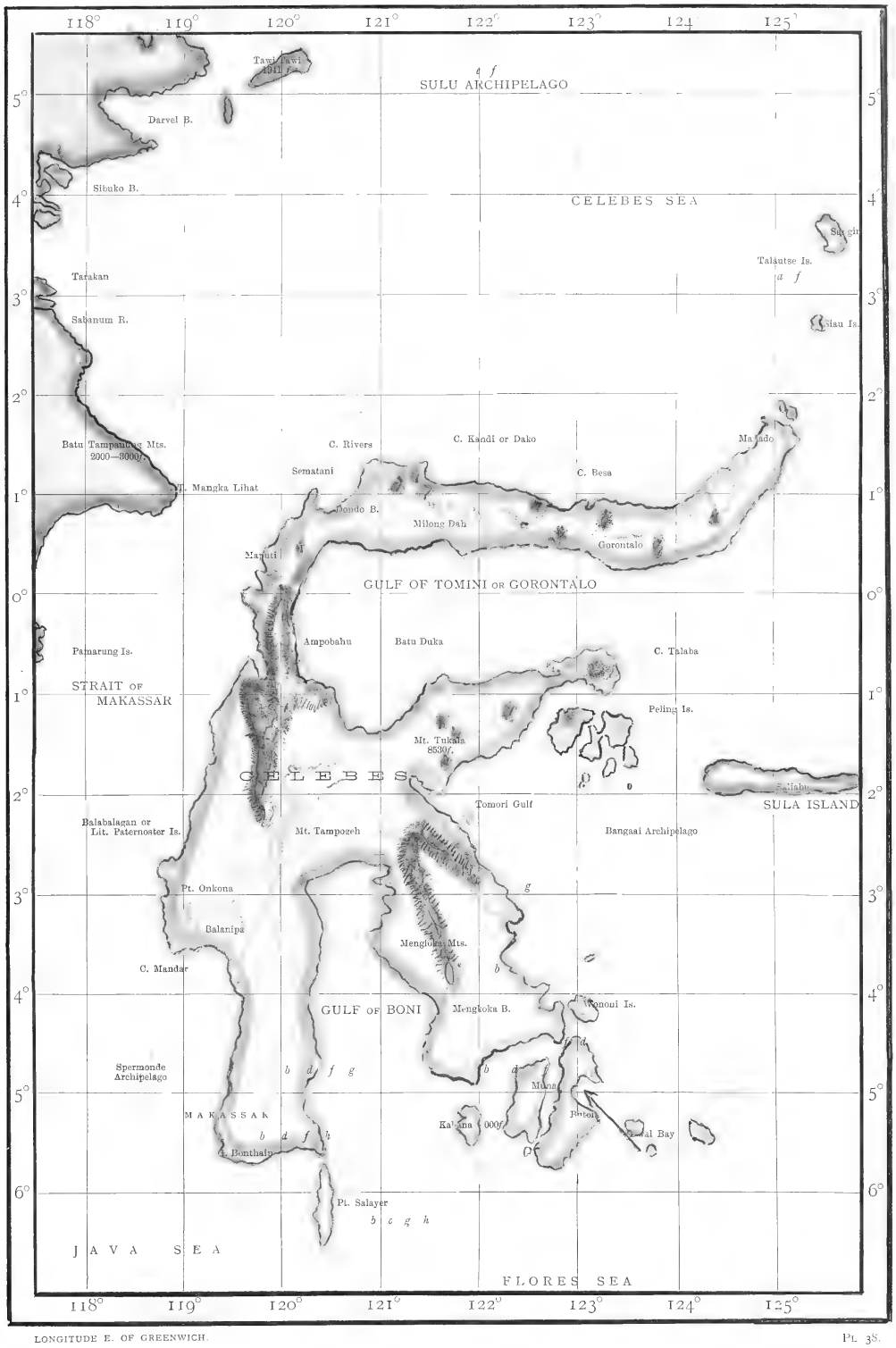
LONGITUDE E. OF GREENWICH.

Explanation of the Letters in This Map.

a. Trogonoptera Brookeana
b. ,, ,,
c. ,, ,, *var. Albescens.*
d. Pompeoptera Vandepolli.
e. ,, ,, *var. Honrathiana.*
f. P. Amphrysus, type.
g. P. ,, *var. Sumatranus.*
h. P. ,, *var. cuneifer.*
i. P. ,, *var. ruficollis.*
j. P. ,, *var. flavicollis and ruficollis.*
k. P. ,, *var. palawanus.*
l. P. Pompeus, type.
m. P. Miranda.
n. P. Cerberus.
o. P. Helena, *var. jupiter.*
p. P. ,, *var. Holzi.*

Names of Localities Indicated by Numbers.

1. Pontianak.
2. Saribu Saratus Mountains, S.W. to N.E.
3. Dabon.
4. Bunguran Isle.
5. Subi Isle.
6. Buku Isle.
7. Sirbassen Isle.
8. Singkep Isle.
9. Linga Isle.
10. Bentam Isle.
11. Carimata Isle.



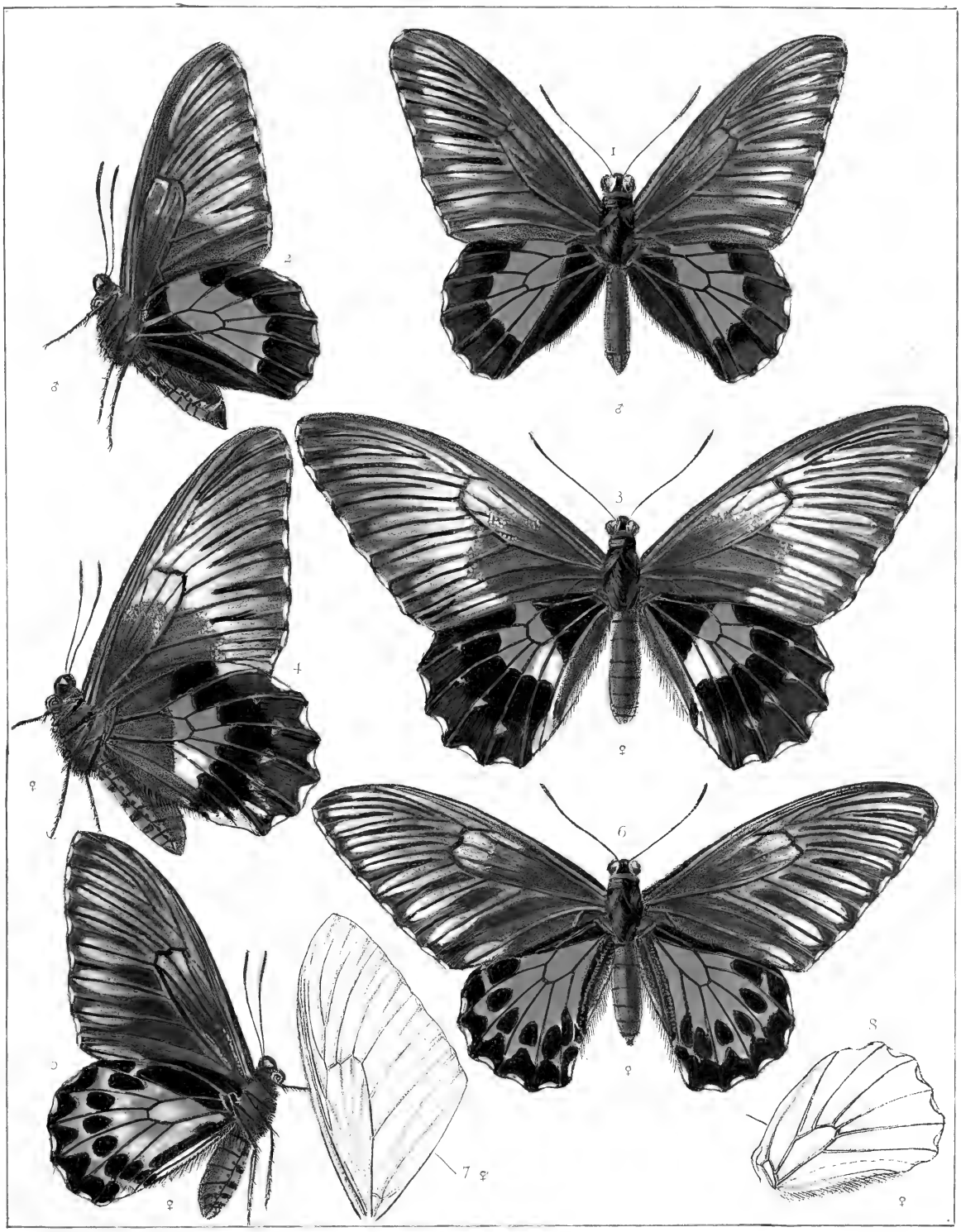
LONGITUDE E. OF GREENWICH.

PL 3S.

Geographical distribution of the Genera Trogonoptera and Pompeoptera.

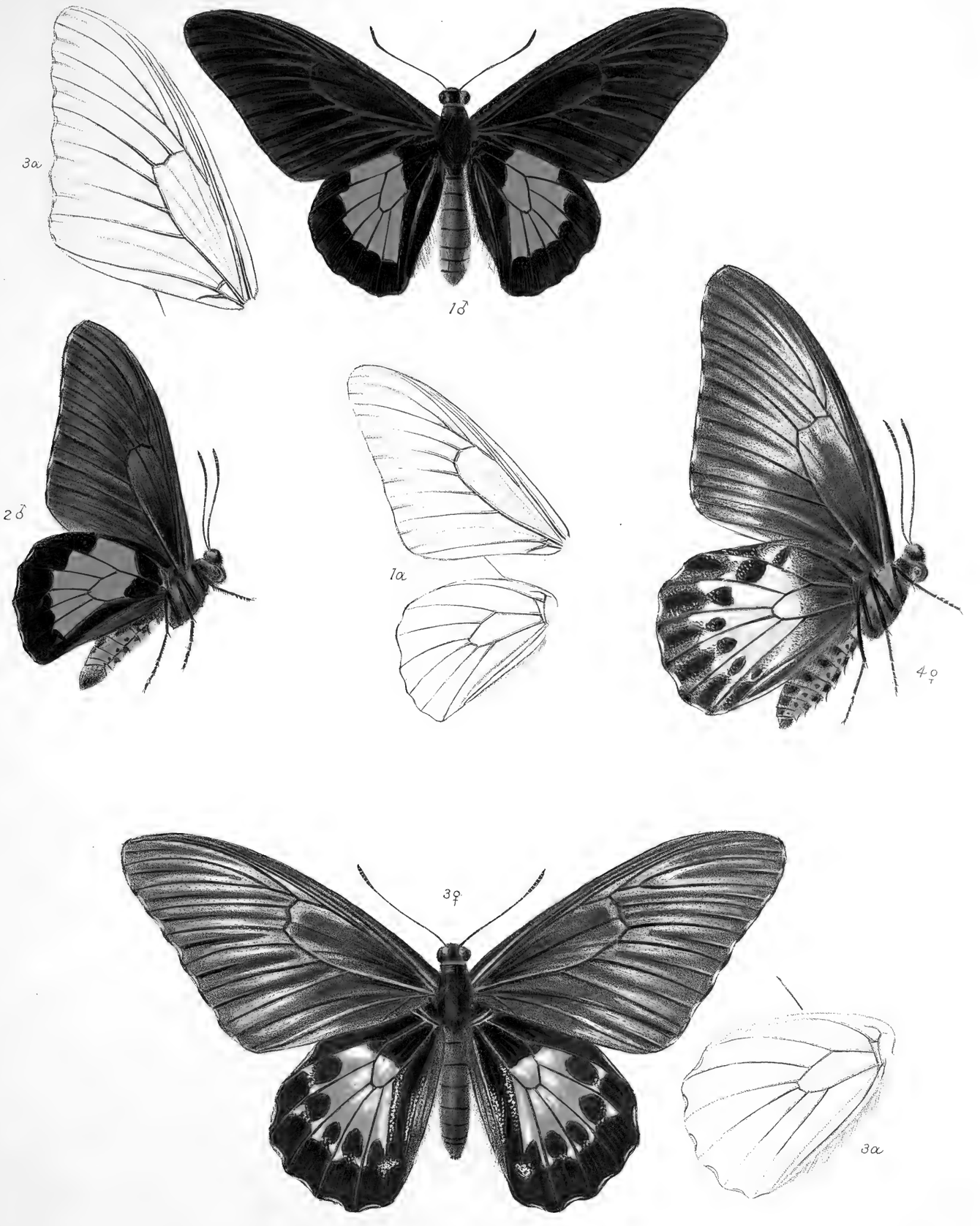
EXPLANATION OF THE LETTERS IN THIS MAP.

a. P. Dohertyi, type, and *v. Fasciculatus.*
b. P. Haliphron.
c. P. Bauermanni
d. P. Hippolytus, *v. Cellularis*
e. P. Hippolytus, *v. Sulaensis.*
f. P. Hippolytus, type form.
g. P. Hephæstus
h. P. Helena, v. *Leda.*



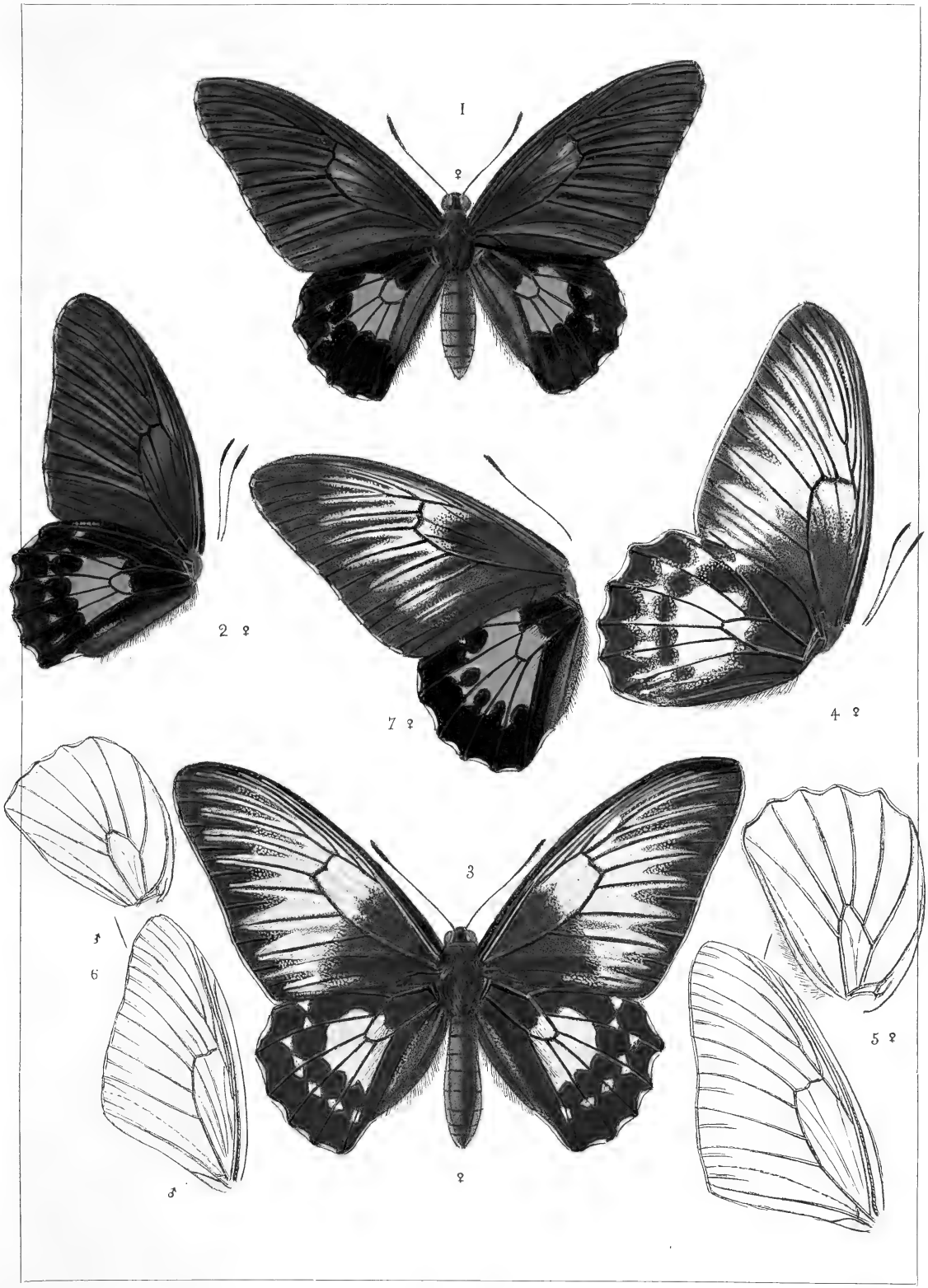
Robt. H. F. Rippon, del. et Pinxit. 1904. R. Morgan, Imp.

POMPEOPTERA PLATO, Wallace. *Figs. 1, 2, ♂ : 3, 4, ♀ : 5, 6, Felder's type ♀ ; 7, 8, Neuration of type ♀.*



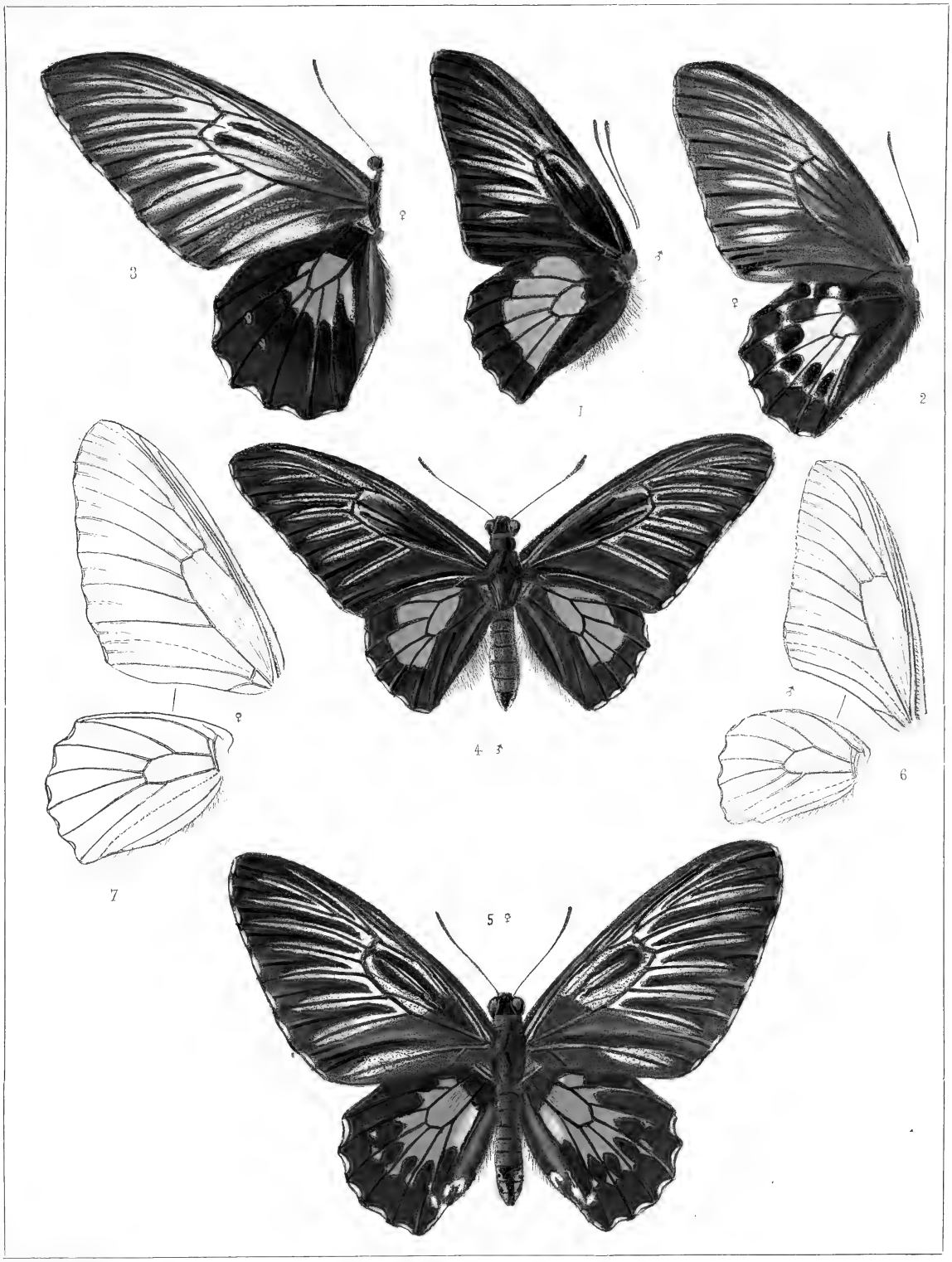
Rob^t H.F.Rippon, del. et lith. 1899. Hanhart imp.

POMPEOPTERA CRITON, *Felder (Felder's types)*, *Figs. 1, 2, ♂, 3, 4, ♀.*
1a, Neuration of ♂; 3a, Neuration of ♀.



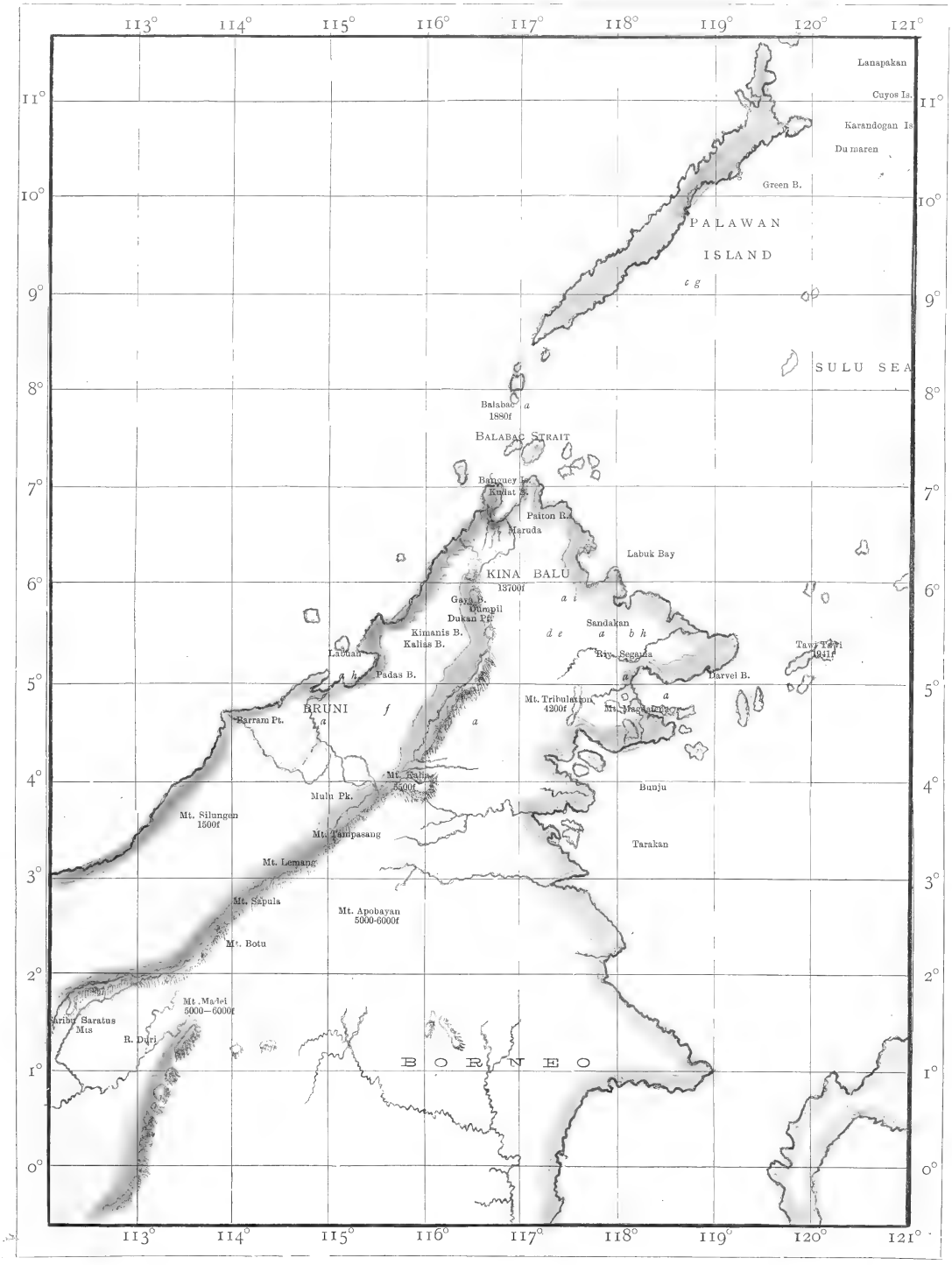
Robt. H. F. Rippon, del et lith. 1906.

POMPEOPTERA CRITONOIDES, *Fruhstorfer*, Figs. 1, 2 ♀ ; 3, 4, ♀ ; 5, ♀ Neuration ; 6, ♂ Neuration.
POMPEOPTERA CRITON, var. *Oberthüri*, Rothschild, ♀, Fig. 7.



Robt. H. F. Rippon, del et lith. 1906.

POMPEOPTERA CRITON, *v. Felderi*, Rothschild, *Fig.* 2 ♀ ; P. CRITONOIDES, Frühstorfer 1, ♂ ; P. IRIS, Röbur, 3, ♀ *var.* ; P. NAIAS, Doherty, 4 ♂, 5 ♀ ; 6 ♂, 7 ♀ neuration.

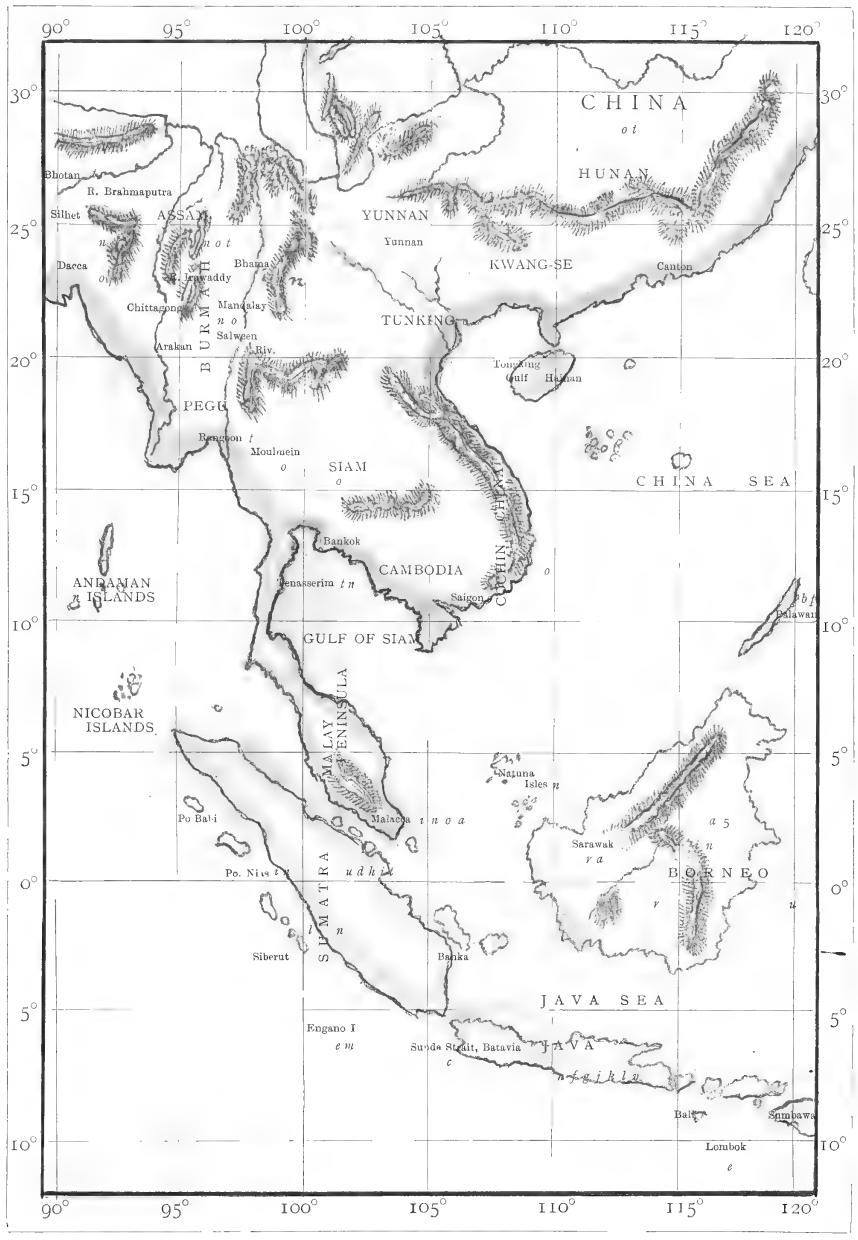


LONGITUDE E. OF GREENWICH.

Pl. 43.

EXPLANATION OF LETTERS IN THIS MAP.

a Trogonoptera Brookeana.
b ,, ,, v. *eleanor*.
c ,, Trojana.
d Pompeoptera flavicollis.
e ,, ruficollis.
f Pompeoptera Cerberus.
g ,, Plateni.
h ,, Miranda.
i ,, Andromache.

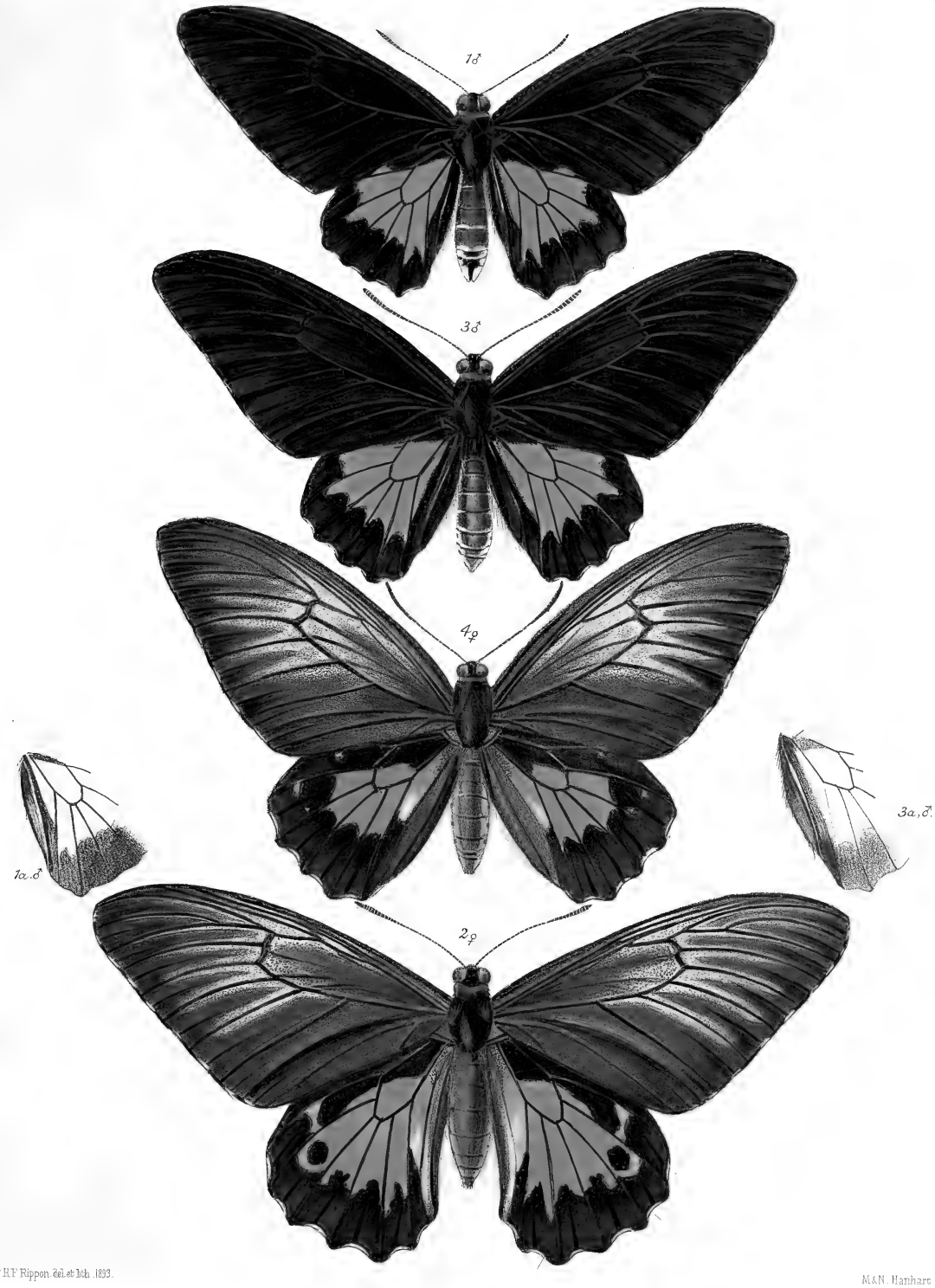


LONGITUDE E. OF GREENWICH.

PL 44.

EXPLANATION OF LETTERS IN THIS MAP.

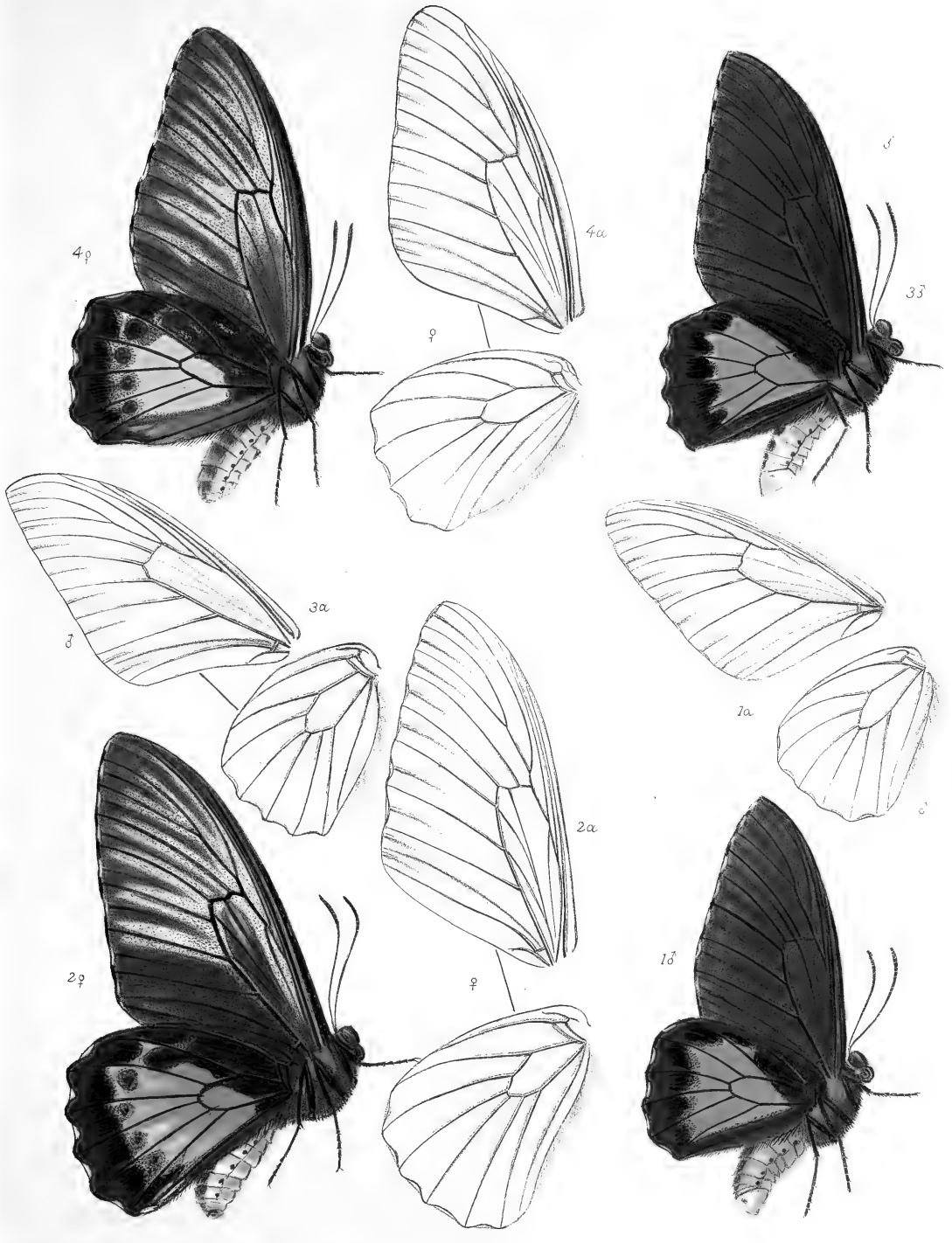
a T. Brookeana.
b T. Trojana.
c P. Vandepolli.
d P. Vandepolli, v. *Honrathiana.*
e P. Naias.
f P. Amphrysus.
g P. Amphrysus, v. *palabuana.*
h P. Amphrysus, v. *sumatranus.*
i P. Amphrysus, vs. *ruficollis* and *flavicollis.*
j P. Cuneifera.
k P. Helena, v. *jupiter.*
l P. Helena, v. *Holzi.*
m P. Nereis.
n P. Cerberus.
o P. Æacus.
p P. Plateni.
r P. Miranda.
s P. Andromache.
t P. Minos.
u P. Amphrysus, v. *Olympia.*
v P. Pompeus, type.



Rob^t. H. F. Rippon. del. et lith. 1893.

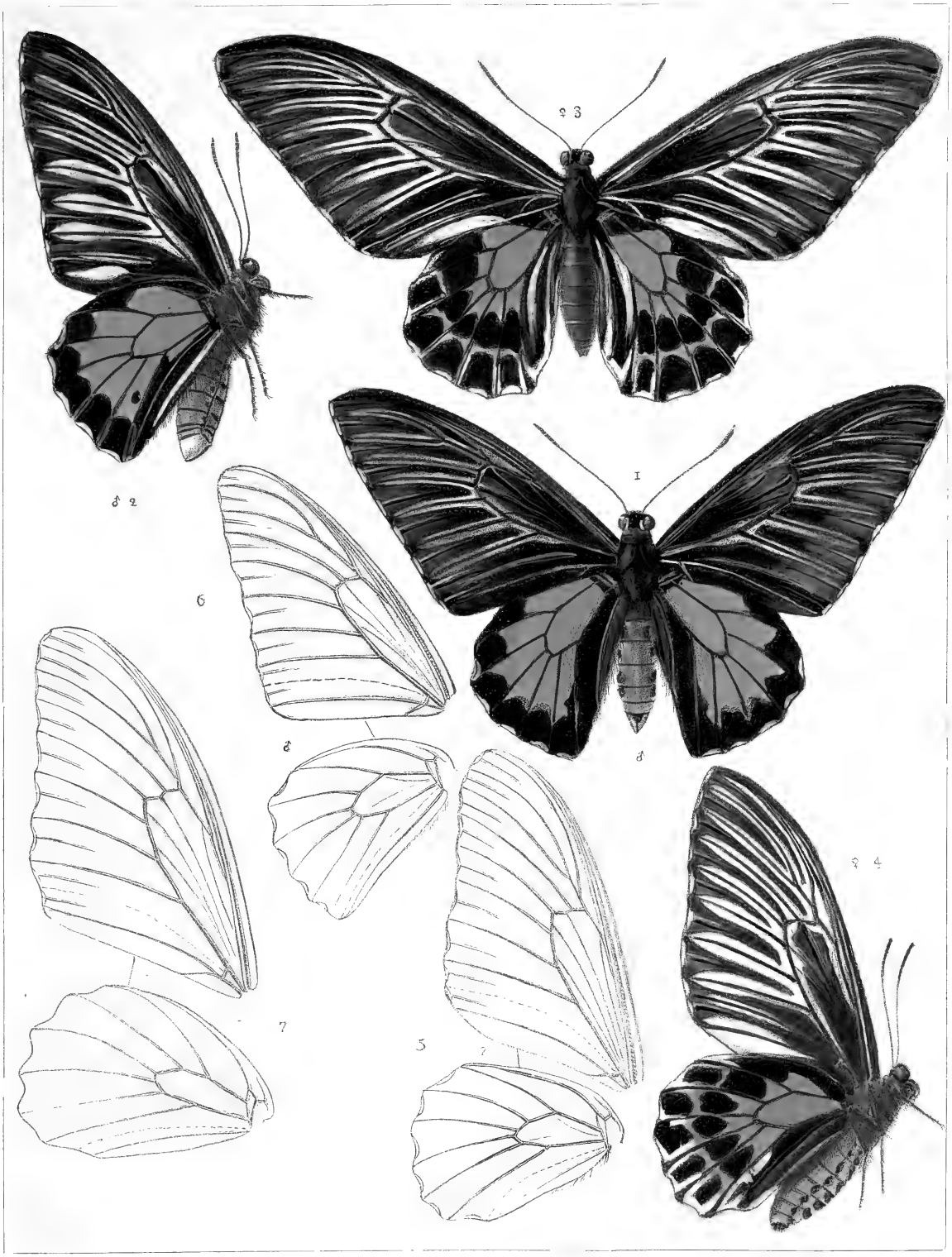
M. & N. Hanhart. imp.

POMPEOPTERA. PAPUENSIS ♂, *Wallace* 1 ♀, *Oberthür*, 2; POMPEOPTERA. *melpomona* ♂, *Rippon*, 3; ♀, 4; *abdominal marginal pouch of* PAPUENSIS ♂, 1a *ibid of* MELPOMONA ♂, 3a



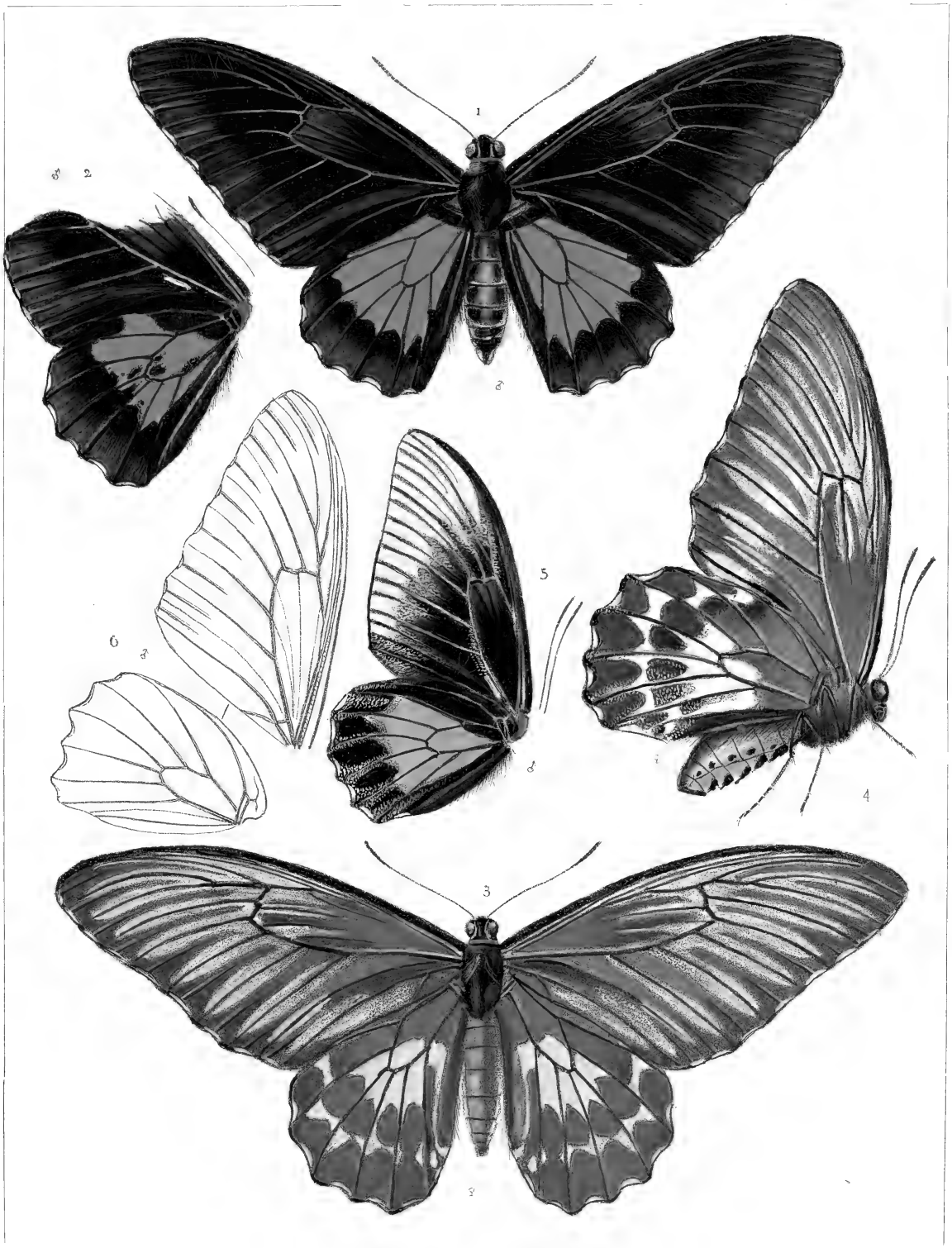
Robert H.F.Rippon del et lith,1897. Hanhart imp

POMPEOPTERA PAPUENSIS, *Figs 1♂; 1a neuration; 2♀; 2a neuration;*
P.MELPOMONA, *Figs 3♂; 3a neuration; 4♀; 4a neuration .*



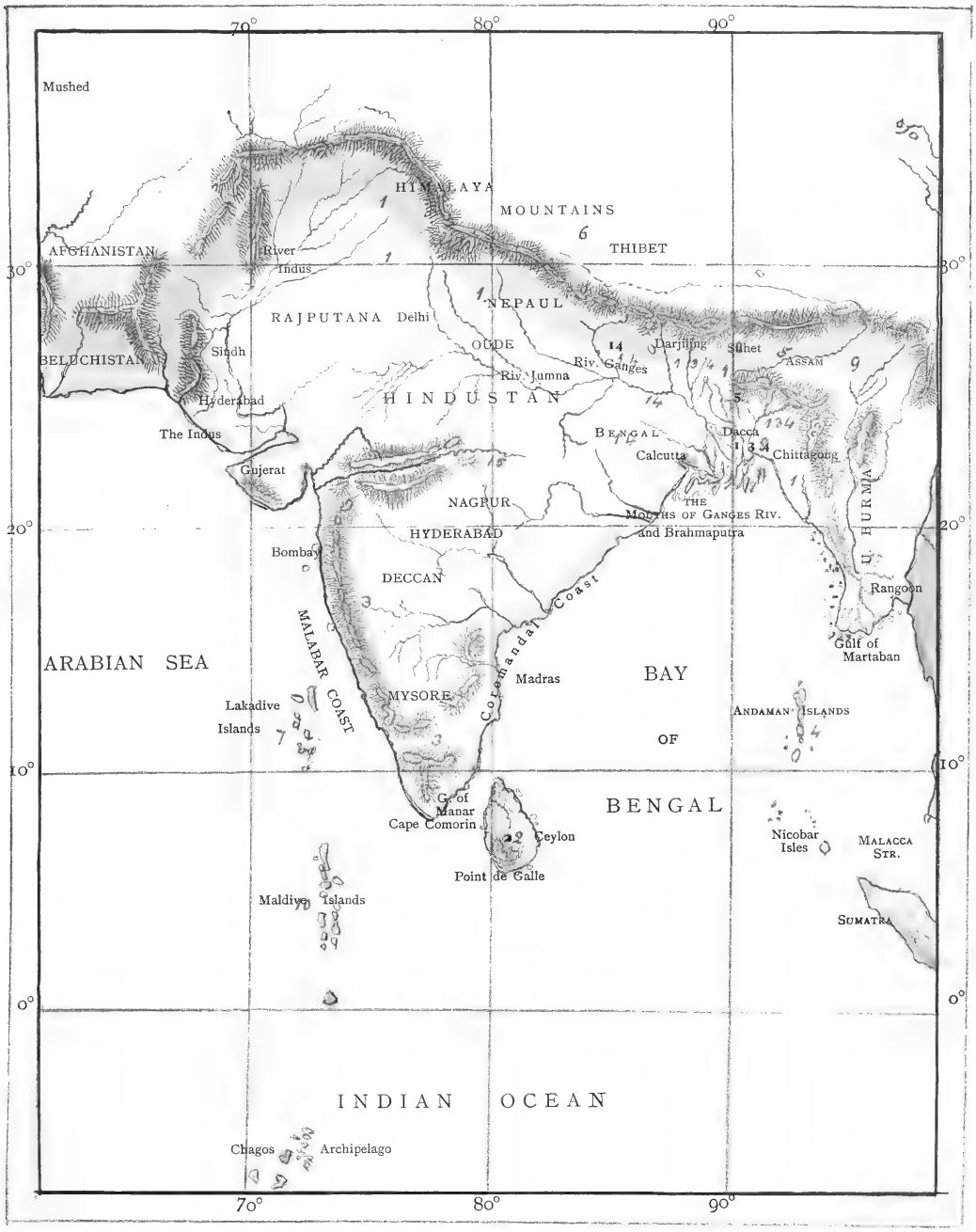
Robt. H. F. Rippon, del et lith. 1906.

POMPEOPTERA MINOS, *Cramer*, *Figs. 1, 2, ♂ ; 3, 4, ♀ ;* Neuration of *♂, 6;* of *♀ 5;* Neuration of *♂* of P. HELENA *Linnæus, 7.*



Robt. H. F. Rippon, del et lith. 1906.

POMPEOPTERA HELENA, *Linnæus*, *Figs. 1*, ♂ ; *3*, *4*, ♀ ; *var. Grose-Smithi*, Rippon, ♂, *2* ; *v. Carolus*, Frühstorfer, ♂, *5* ; Neuration of ♂, *6*.



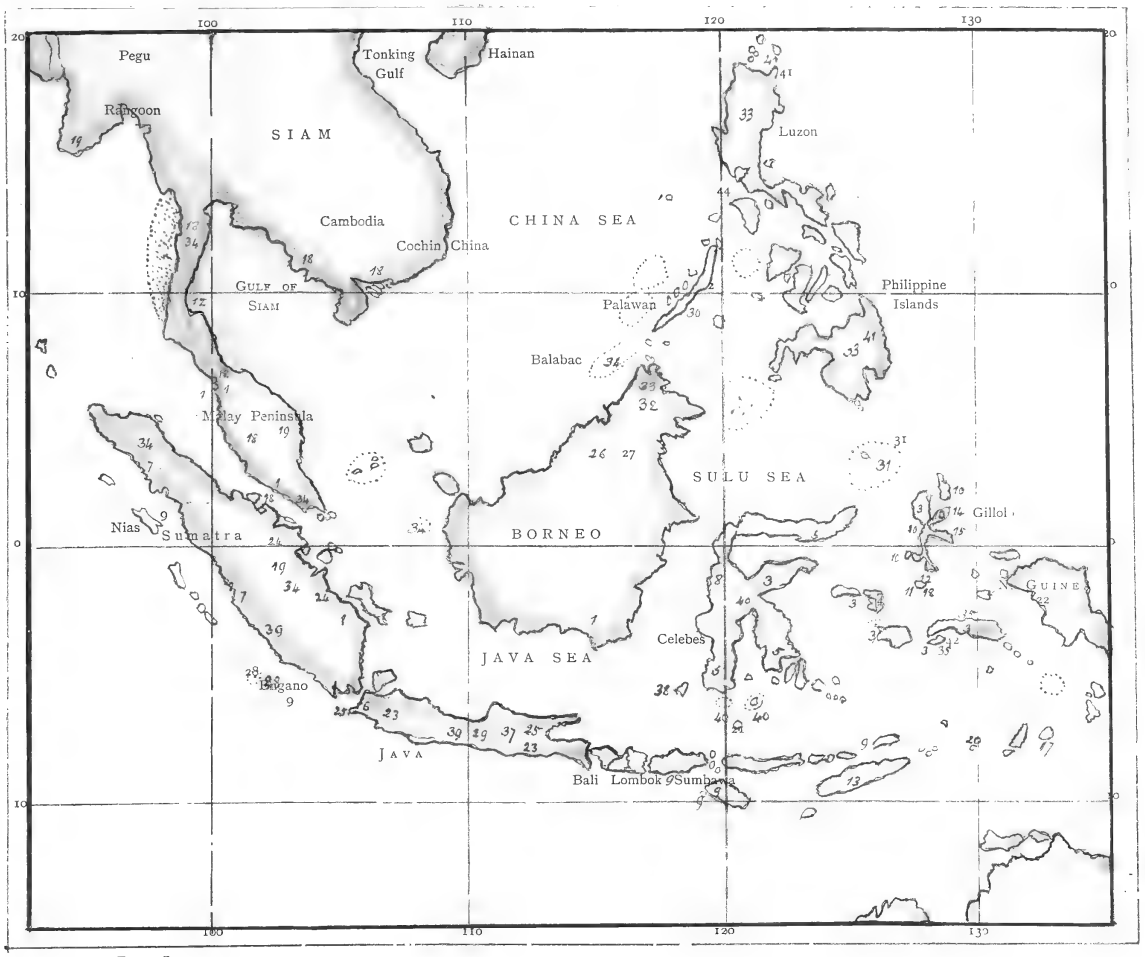
LONGITUDE E. OF GREENWICH.

Geographical distribution of the Genus POMPEOPTERA.

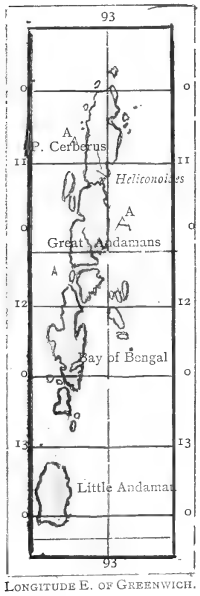
EXPLANATION OF THE FIGURES IN THIS MAP.

1. Pompeoptera Æacus.
2. P. Darsius.
3. P. Minos.
4. P. Cerberus.
5. Brahmaputra River.
6. Lhassa.
14. Sikkim.
15. Nerbudda River.
16. Bhotan.

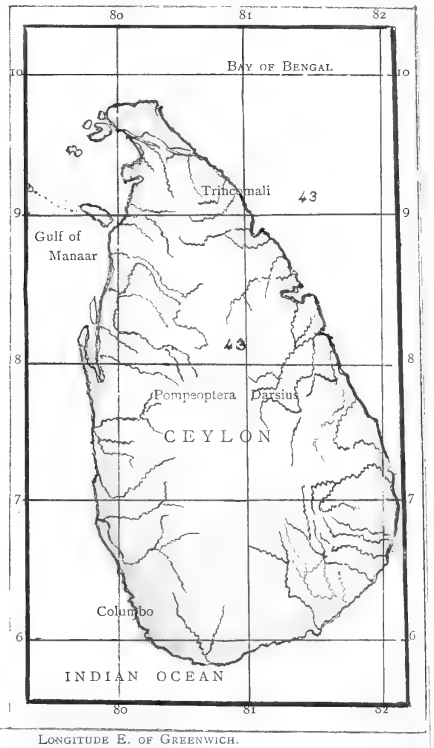
Geographical Distribution of the Genera Trogonoptera and Pompeoptera (part), from Longitude 91° 50° to 132° 0° E; and Latitude 20° 0° N. to 10° 0° S.; also of Ceylon and Andaman Isles.



LONGITUDE E. OF GREENWICH.



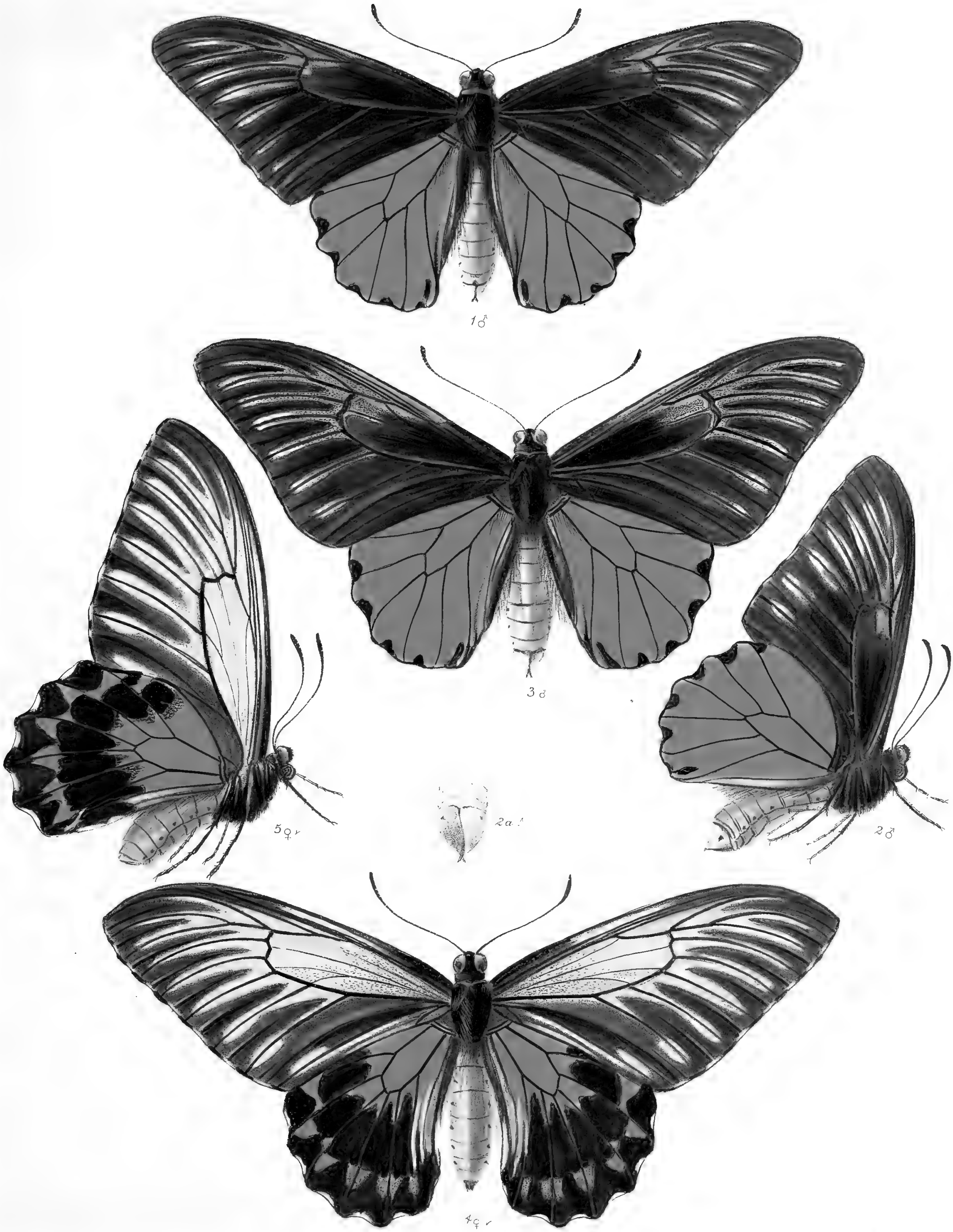
LONGITUDE E. OF GREENWICH.



LONGITUDE E. OF GREENWICH.

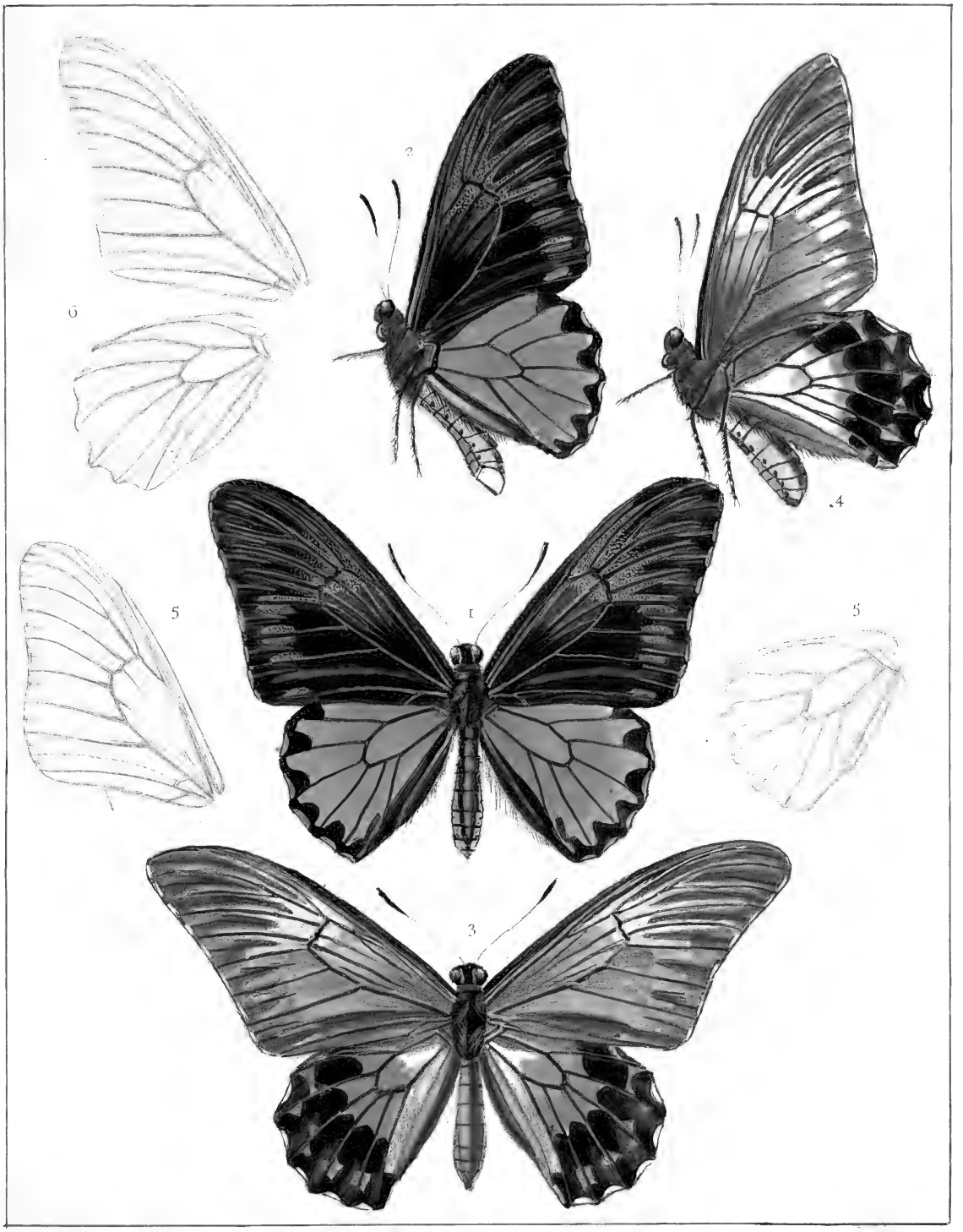
EXPLANATION OF THE FIGURES IN THESE MAPS.

1. Trogonoptera Brookeana.
2. T. Trojana; 30. Pompeoptera Plateni.
3. P. Hippolytus; 4. P. Hippolytus, *v. Sulaensis* (Sula)
5. ,, *v. Cellularis.*
6. P. Vandepolli; 7. *v. Honrathiana.*
8. P. Haliphron; 9. P. Naias.
10. P. Criton; 11. P. Critonoides.
12. Ornithoptera Obiensis.
13. Pompeoptera Plato; 14. P. Criton, *v Felderi.*
15. P. Criton, *v Oberthuri;* 16. P. Iris (Isle of Letti),
17. P. Riedeli; 18. P. Æacus; 19. P. Minos.
20 P. Staudinger (Babba Isle)
21. P. Haliphron, *v. Pistor* (Djampea Isle).
22. P. Helena, *v. Papuensis.*
23. P. Amphrysus; 24. *v. Sumatranus;* 25. *v. Cuneifer.*
26. ,, *v. Flavicollis;* 27. *v. Ruficollis*
28. P. Nereis; 29. P. Pompeus.
31. P. Dohertyi (Talautse Isles).
32. P. Miranda; 33. P. Andromache (N. Borneo).
34. P. Cerberus; 35. P Helena (type form) (Amboina)
36. P. Helena, *v. Borouensis* (Bouru Isle). [Ceram.
37. P. Helena *v. Jupiter;* 38. *v. Leda* (Salayer, Macassar)
39. P. Helena, *v Holzi.*
40. P. Hephæstus.
41. P. Magellanus (Babulanes Isles).
42. Ornithoptera Priamus.
43. Pompeoptera Darsius
A. P. Cerberus, *v. Heliconoides.*
44. P. Rhadamanthus (Manilla).



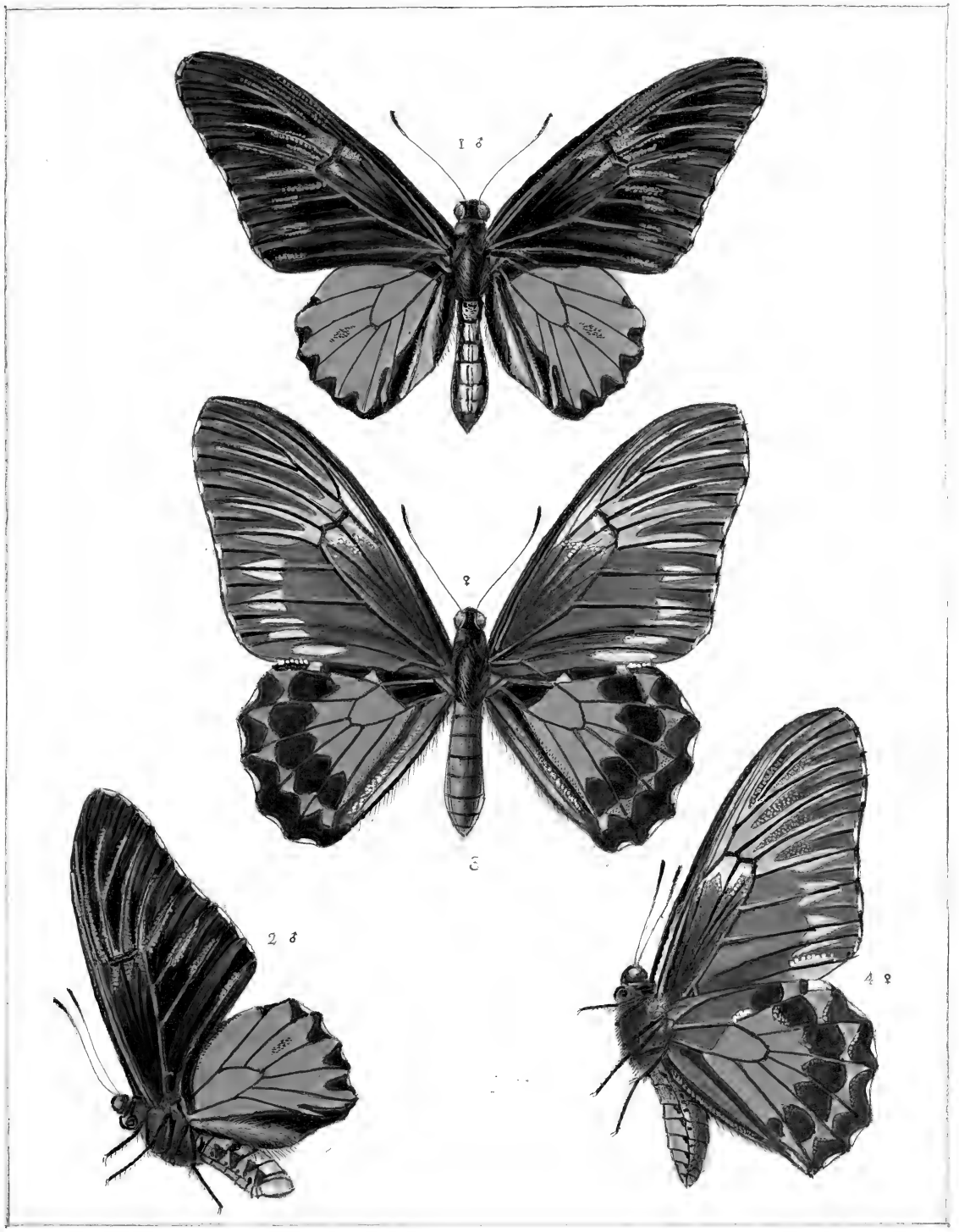
Edw. H. F. [illegible] pinx. del. et lith. 189[illegible]

POMPEOPTERA RUFICOLLIS, *Butler* 1, 2 ♂, 2a, Anal valve.
3 ♂ var. Flavicollis, Drace 4, [illegible]



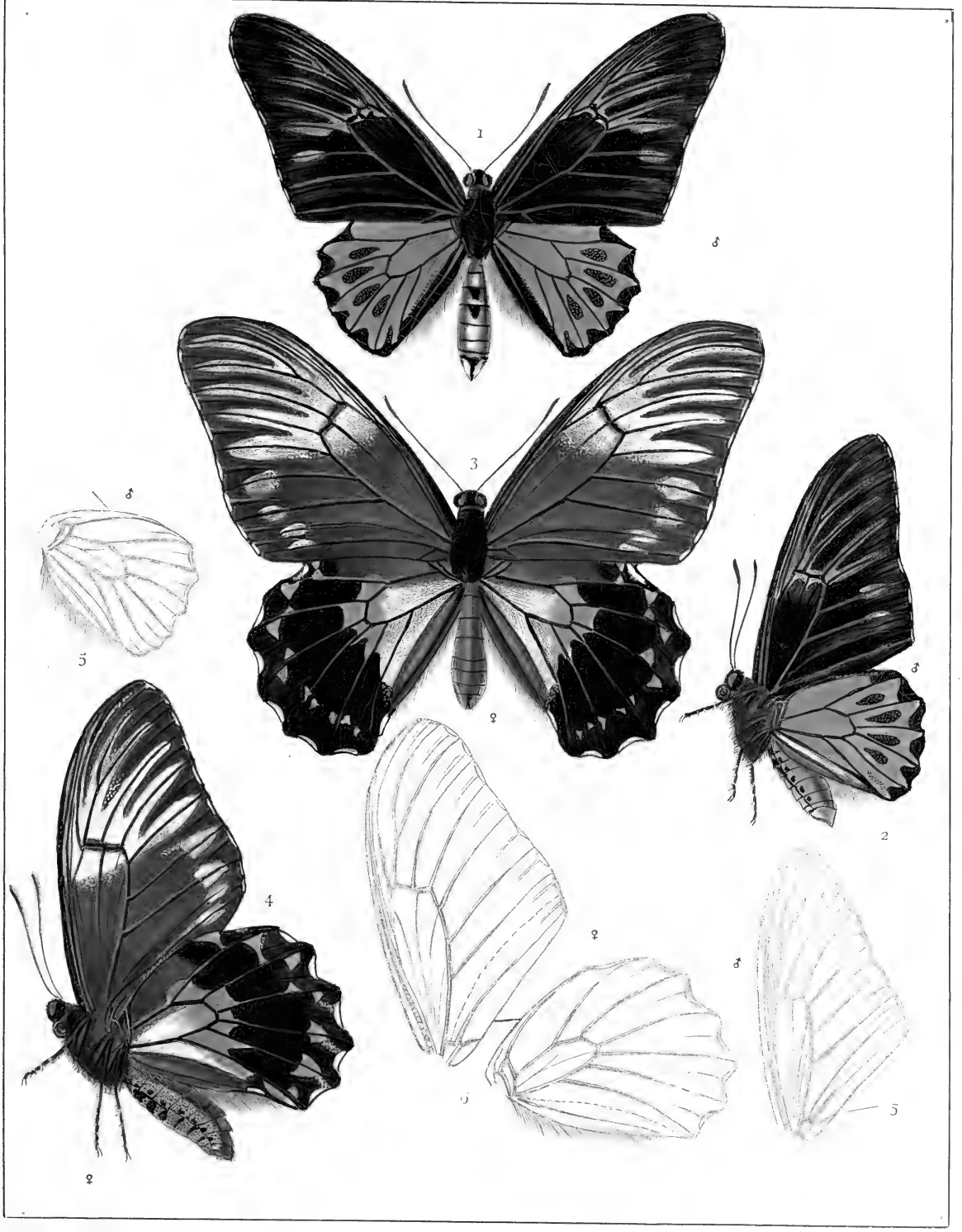
Robt. H. F. Rippon, del. et Pinxit, 1902. R. Morgan, Impr

POMPEOPTERA AMPHRYSUS, Cramer, *1, 2, ♂ ; 3, 4, ♀ ; 5, Neuration of ♂ ; 6, Neuration of ♀.*



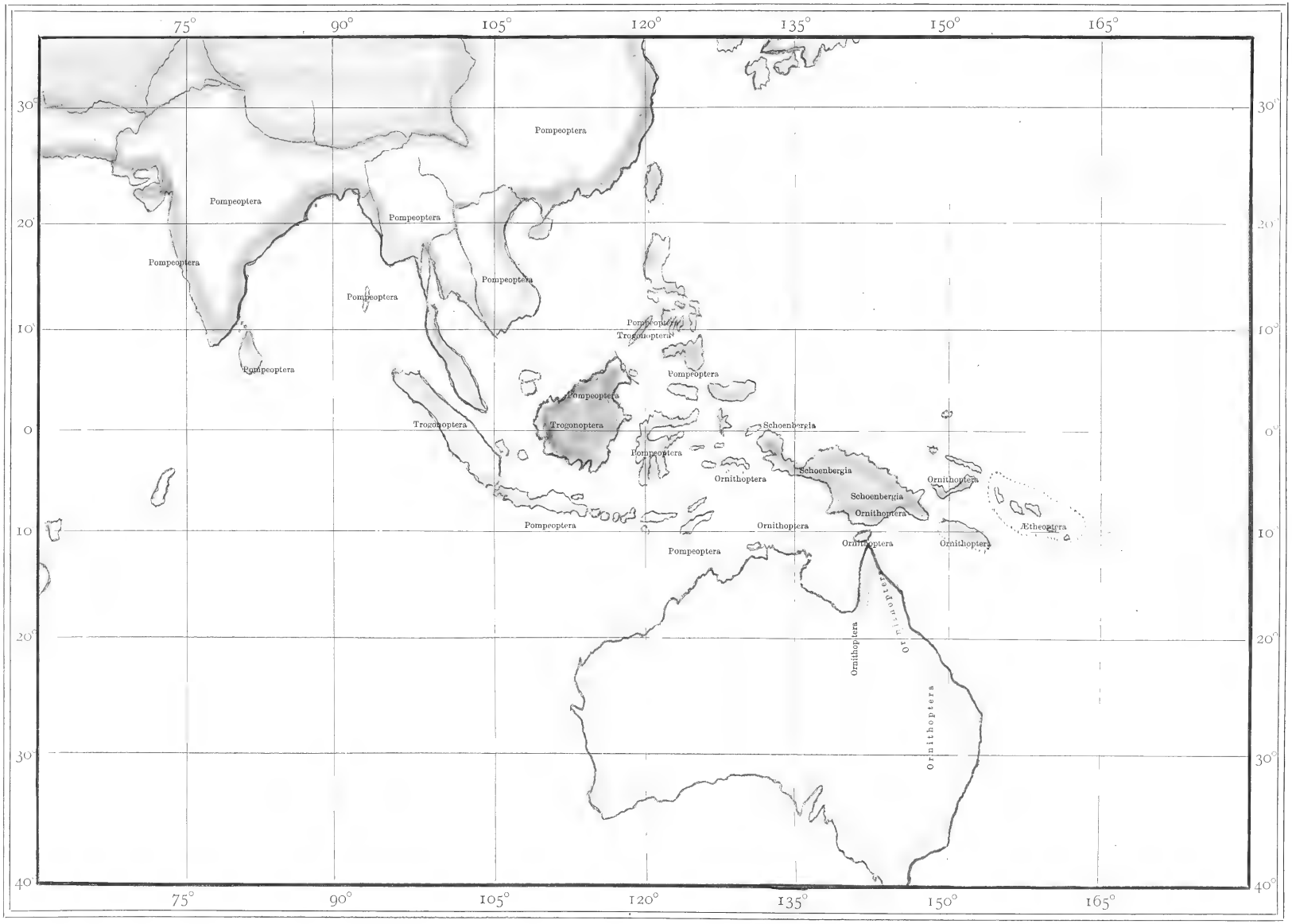
Robt. H. F. Rippon, del. et Pinxit, 1904. R. Morgan, Impr.

POMPEOPTERA AMPHRYSUS *v. Sumatranus, Hagen. Figs. 1, 2, ♂ ; 3, 4, ♀*



Robt. H. F. Rippon, del. et Pinxit, 1903. R. Morgan, Imp.

POMPEOPTERA AMPHRYSUS, *v.* Cuneifera, *Oberth.*, *1*, *2*, ♂ ; *3*, *4*, ♀ ; *5*, *Neuration of* ♂ ; *6*, *Neuration of* ♀ .

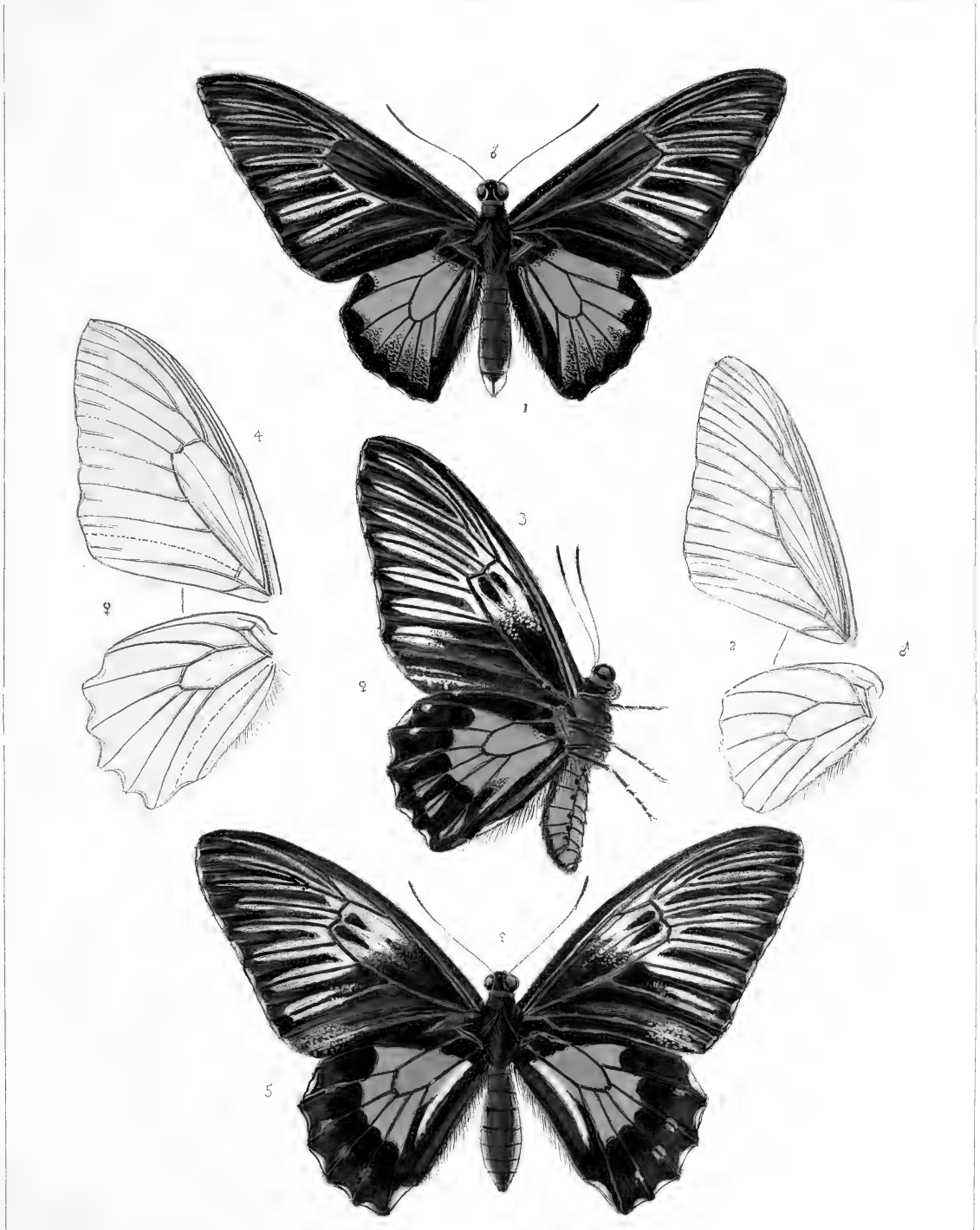


ROBT. H. F. RIPPON, del et lith. 1906.

LONGITUDE E. OF GREENWICH.

Tab.ª ill. H.F.Rippon del. et lith. 1892. M.&N. Hanhart imp.

POMPEOPTERA NEREIS, *Doherty. 1. 2, ♂, 3, Sexual pouch of ♂, above; 4, ibid, below; 5, ibid, opened out; 6, var.ª ♂, 7, under side of abdomen, ♂, 8, 9, ♀.*

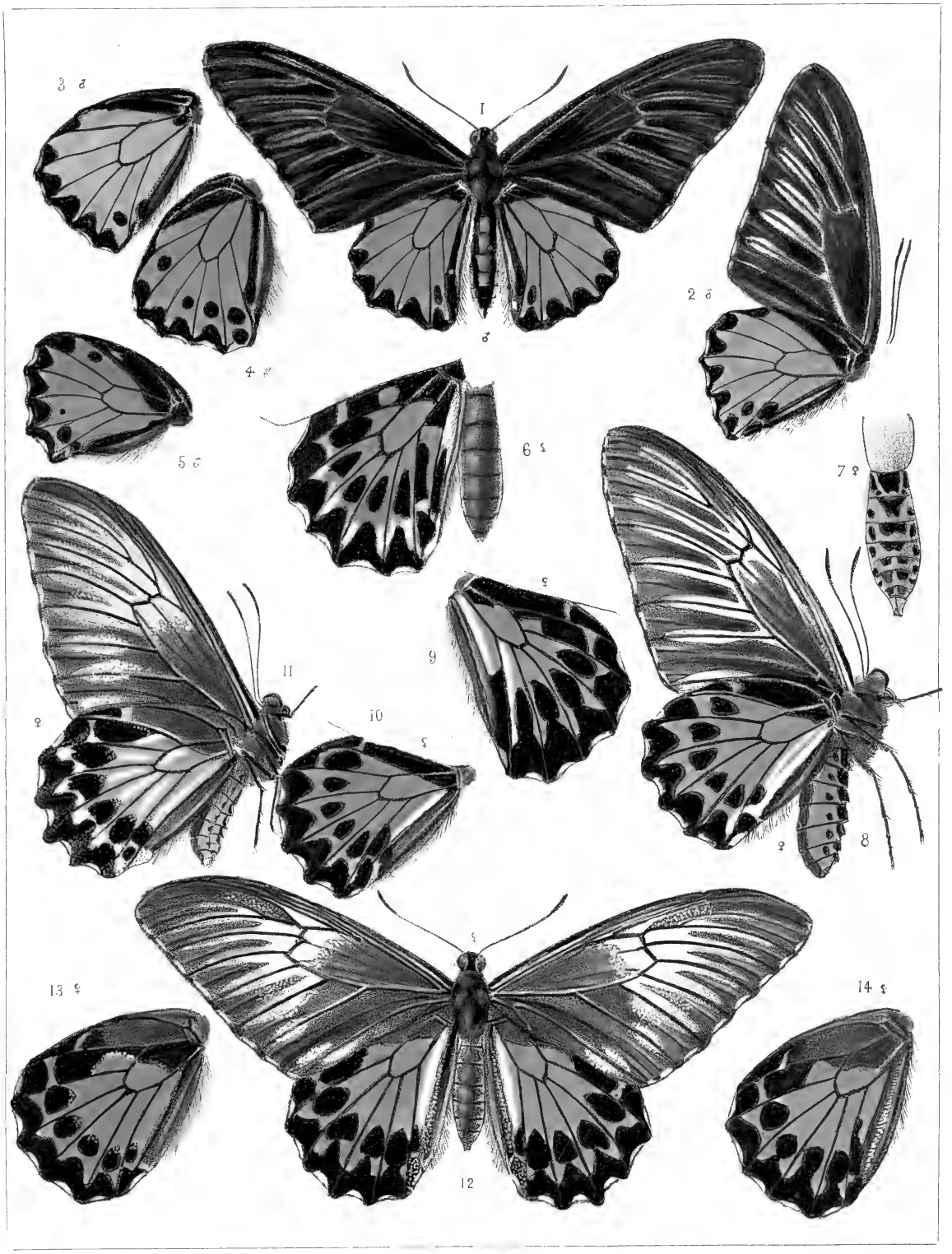


Robert H. F. Rippon, del. et lith., 1907.

Pompeoptera Rhadamantus, *Lucas*, Figs. 1, 3, ♂ ; 2, Neuration of ♂ ; 5, ♀ ; 4, Neuration of ♀.

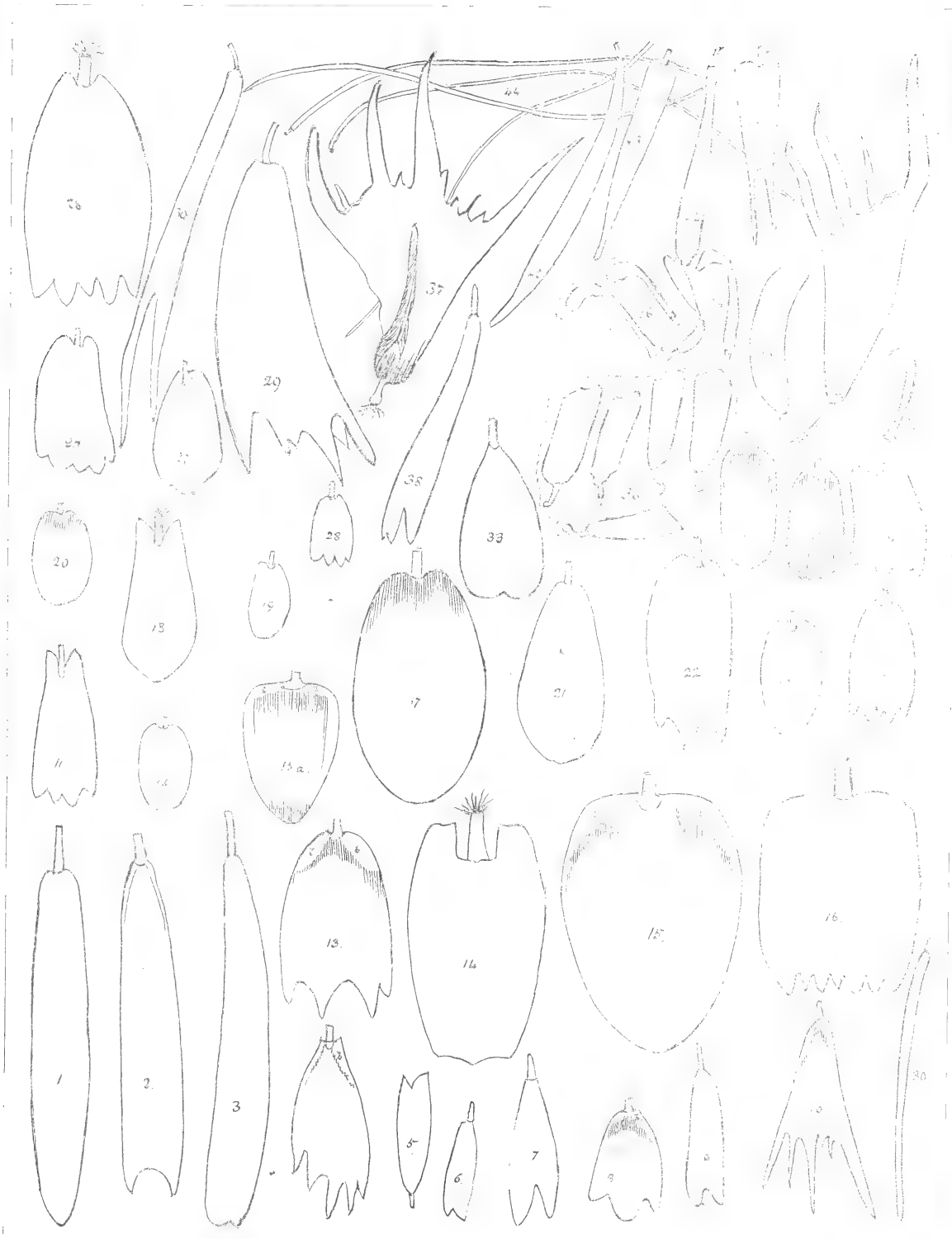
Rd^t H.E.Rippon del et lith. 1895. M & N. Hanhart imp.

POMPEOPTERA POMPEUS, *Cramer, Figs 1,2, ♂; 1a upper side, 2a under side of ♂ abdominal fold or pouch; 2b Subdorsal of ♂ abdomen; 3.4. ♀; 3a, Subdorsal of ♀ abdm.; 5, neuration of ♂, 6, of ♀.*



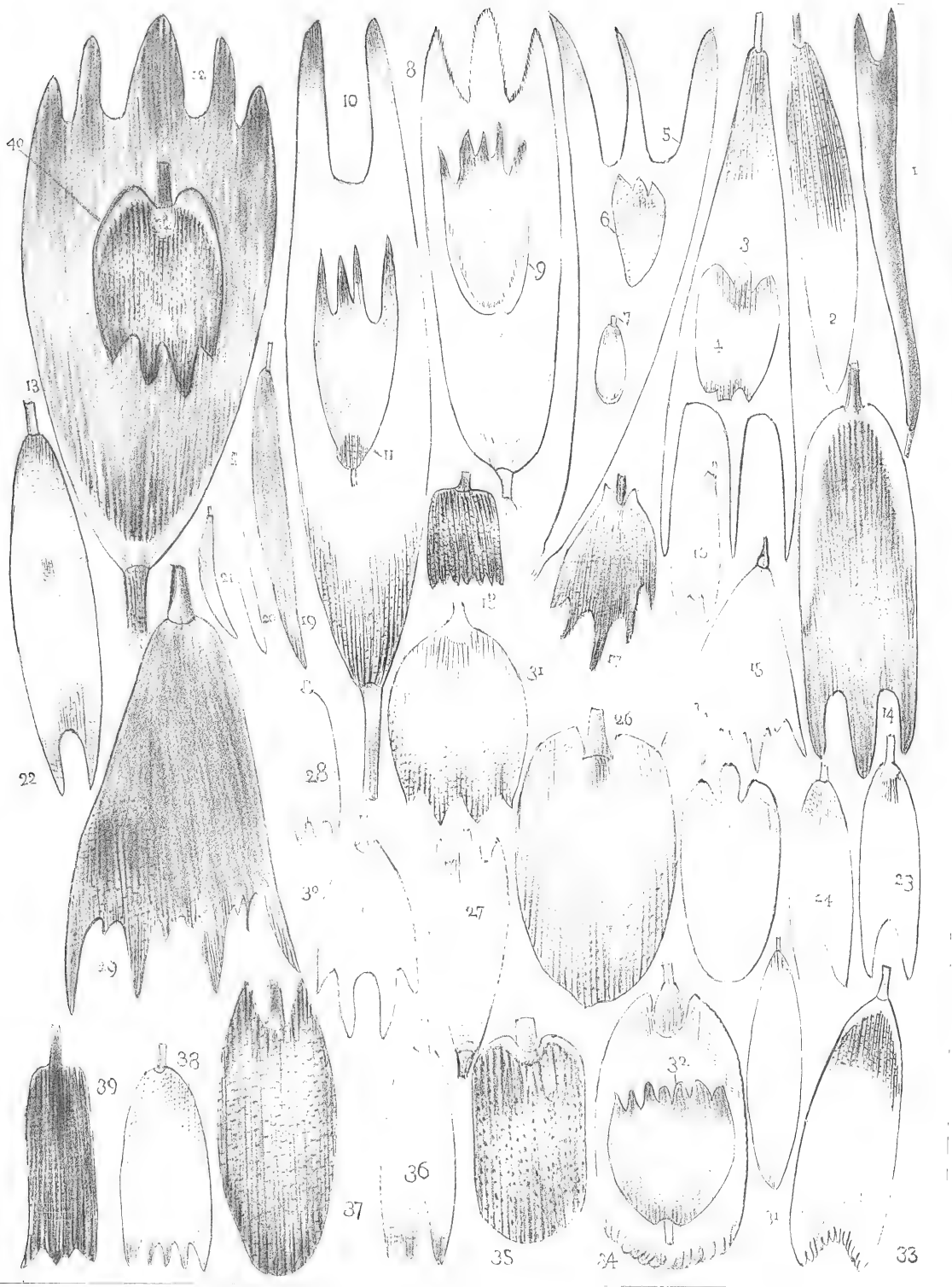
Robt. H. F. Rippon, del et lith. 1906.

POMPEOPTERA CERBERUS, *Felder*, *Figs.* 1, 2, 3, ♂ (Darjiling); 4, ♂, (U. Burmah); 6, Felder's Type, ♀; 8, 9, ♀ vars. (N. India); 10, ♀ (Rangoon); 7, subdorsum of abdomen, ♀. P. POMPEUS, *Cramer*, *Fig.* 5, ♂ (Java); 11, 12, ♀ (Java); 13, 14, ♀, right and left wing of the same example, showing assymetry.



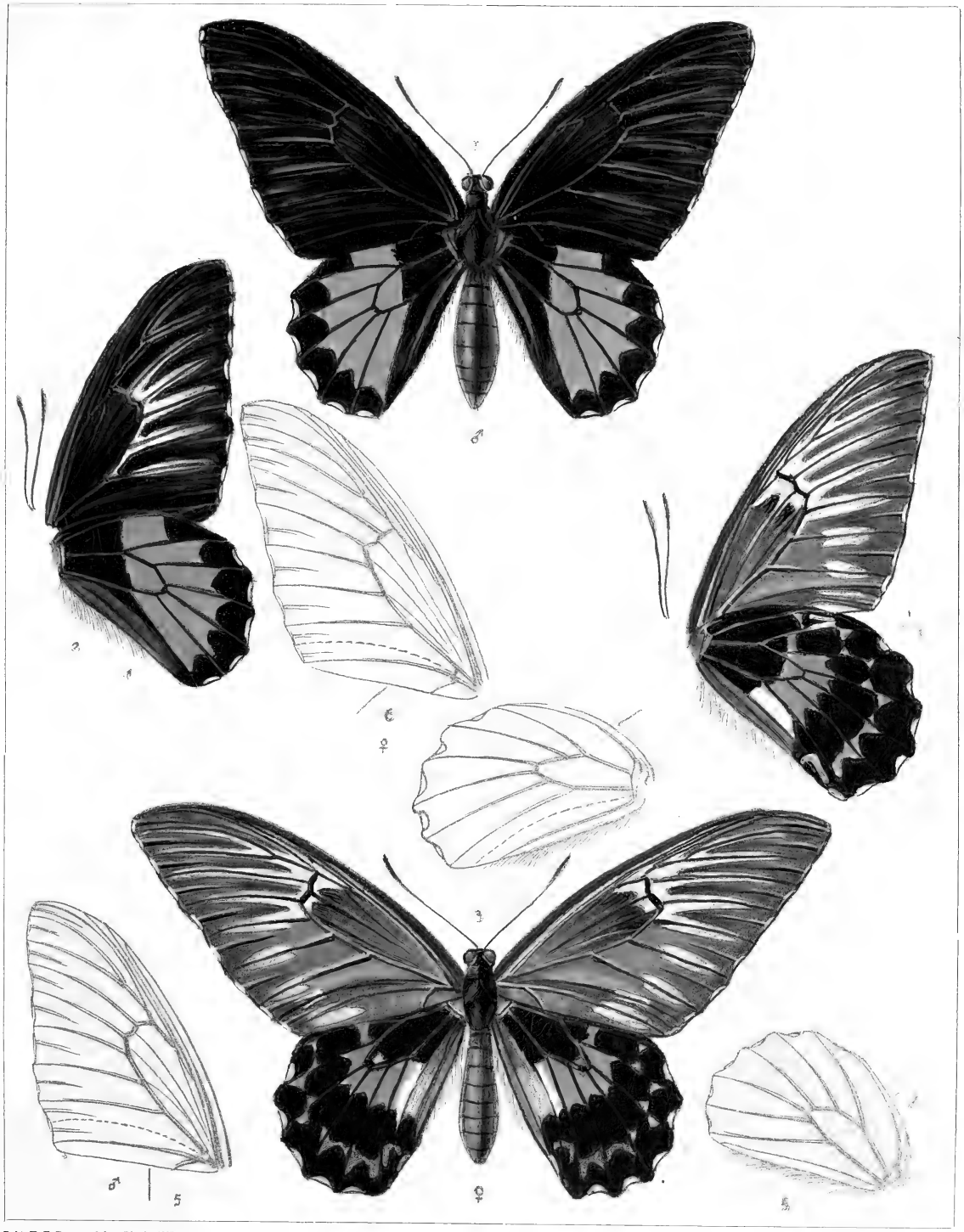
Robt. H. F. Rippon, del. et lith. 1906.

The Wing Scales of the Ornithoptera and their Varied Forms, Greatly Magnified. *Figs 1 to 44.*



Robt. H. F. Rippon, del. et lith. 1906.

The Wing Scales of the Ornithoptera and their Varied Forms, Greatly Magnified. *Figs 1 to 40.*



Robt. H. F. Rippon, del. et Pinxit, 1907.

R. Morgan, Impr.

POMPEOPTERA DARSIUS, *Gray*, Figs. 1, 2, ♂; 3, 4, ♀; 5, Neuration of ♂; 6 of ♀.

ROBERT H. F. RIPPON, del. et lith., 1907.

POMPEOPTERA DOHERTYI, *Rippon*, var. *fasciculatus*, Rothschild, Figs. 1, 2, ♂ ; 3, 4, ♀.

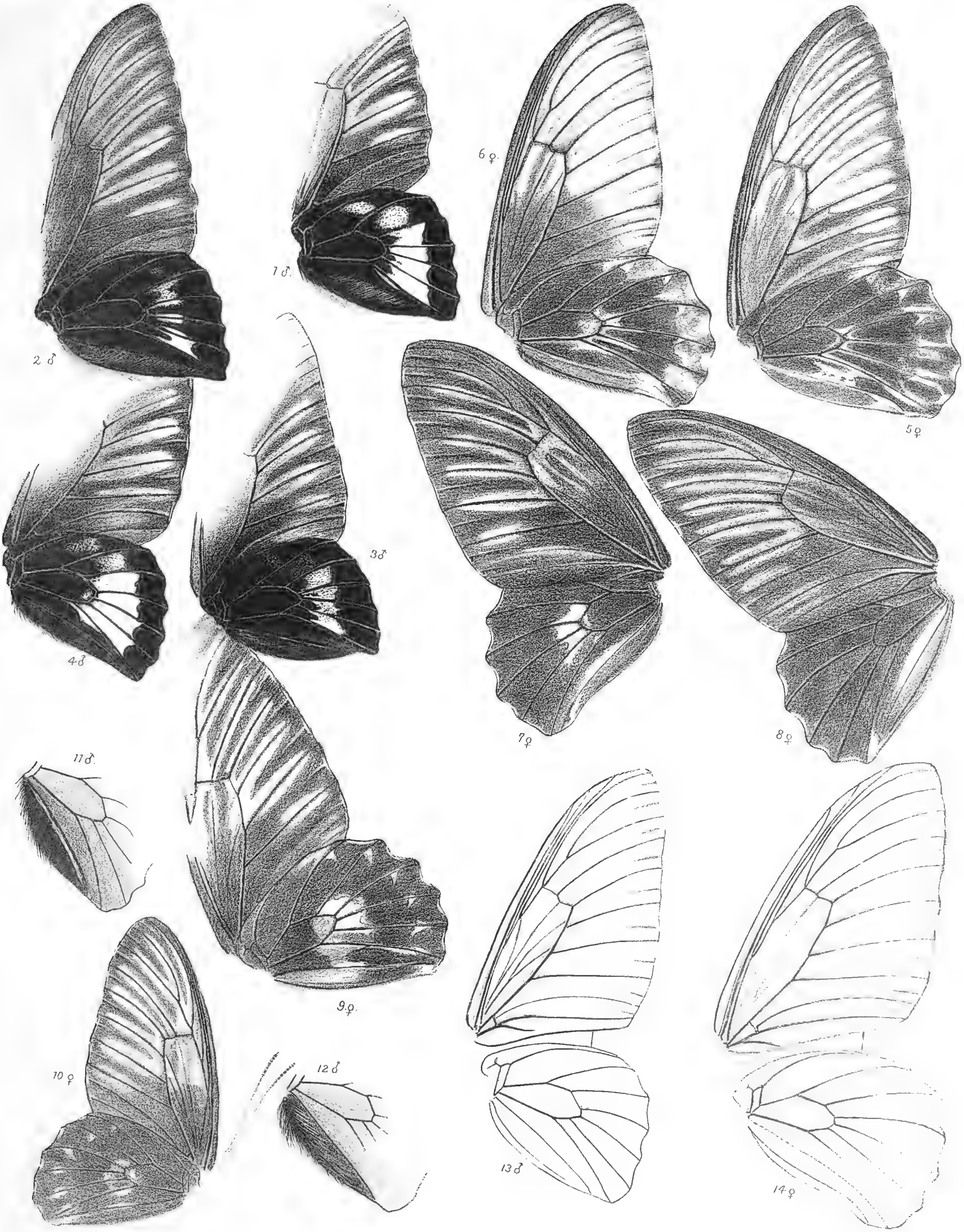
Robert H.F. Rippon del. et lith. 1890 .

M&N Hanhart imp

POMPEOPTERA PLATENI *Staudinger*, 1, 2, ♂, 3, 4, ♀.

Bob^t H.E.Rippon del. et lith 1893 M&N. Hanhart imp

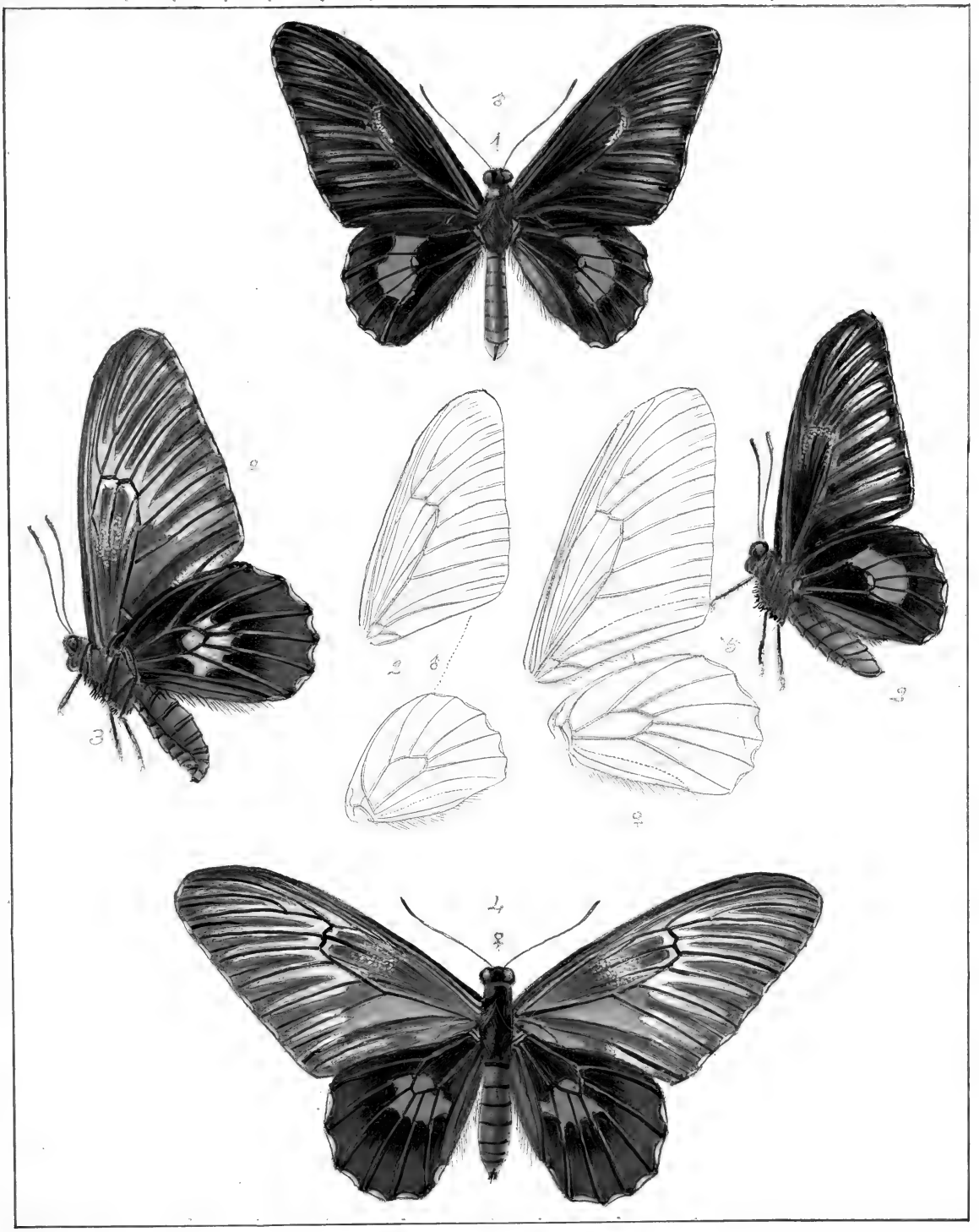
POMPEOPTERA DOHERTYI, *Rippon. 1.2.♂; 3♂. var; 4,5,♀; 6, Subdorsal of Abdomen, ♂; 7 ibid. of ♀.*



Revd H. F. Rippon del et lith. 1893.

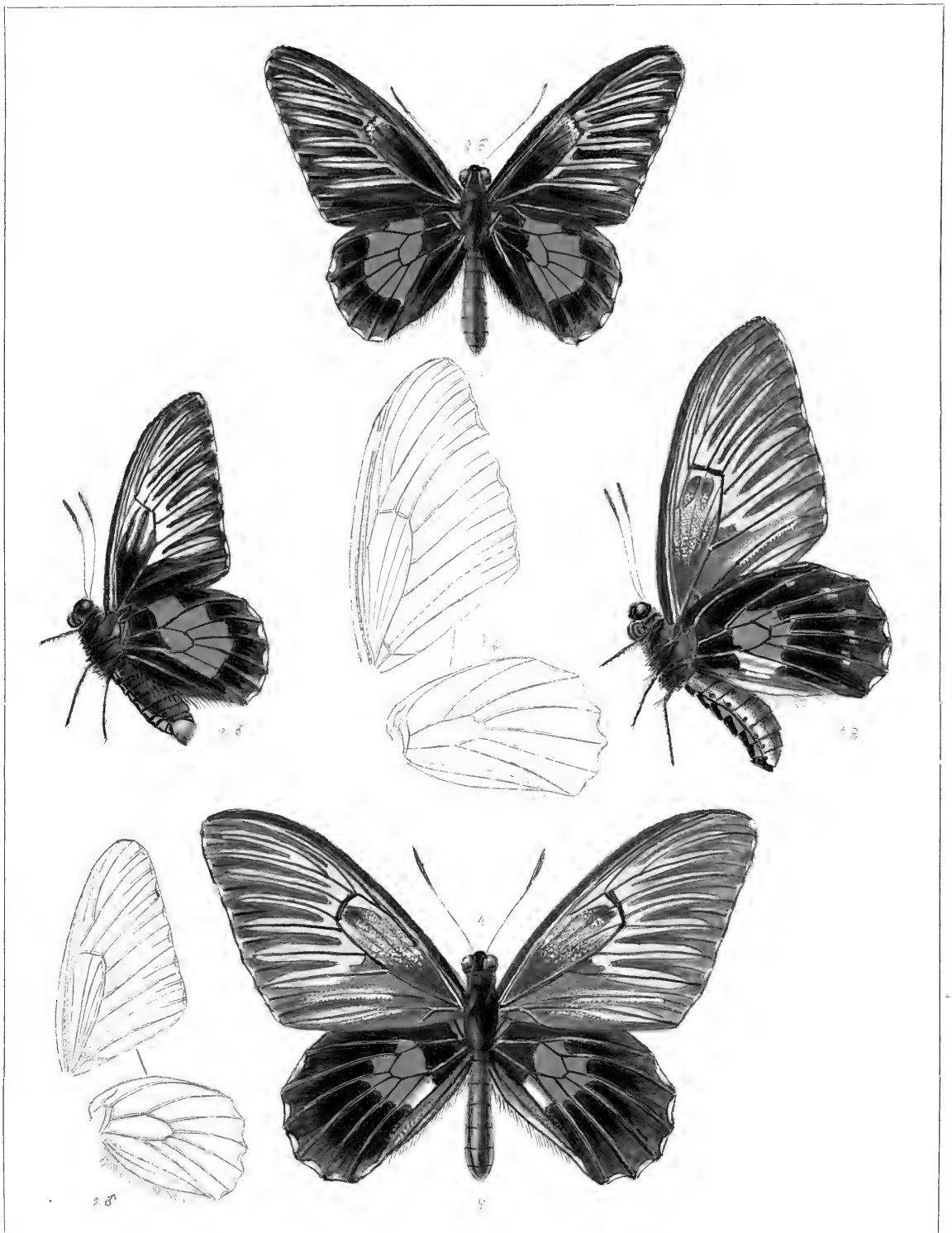
M&N. Hanhart imp.

POMPEOPTERA DOHERTYI, *Rippon* 1.♂, *vars. of 1st type, 1. 4; ♂ vars. of 2nd. type; 2.3. ♀ vars. of 1st type, 7.9; ♀ var. of 2nd type 5,8; ♀ var. of 3rd type, 6; ♀ var. of 2nd type, 10; Abdominal marginal pouch of ♂, upper side 11; under side, 12 Neuration of ♂, 13; of ♀, 14*



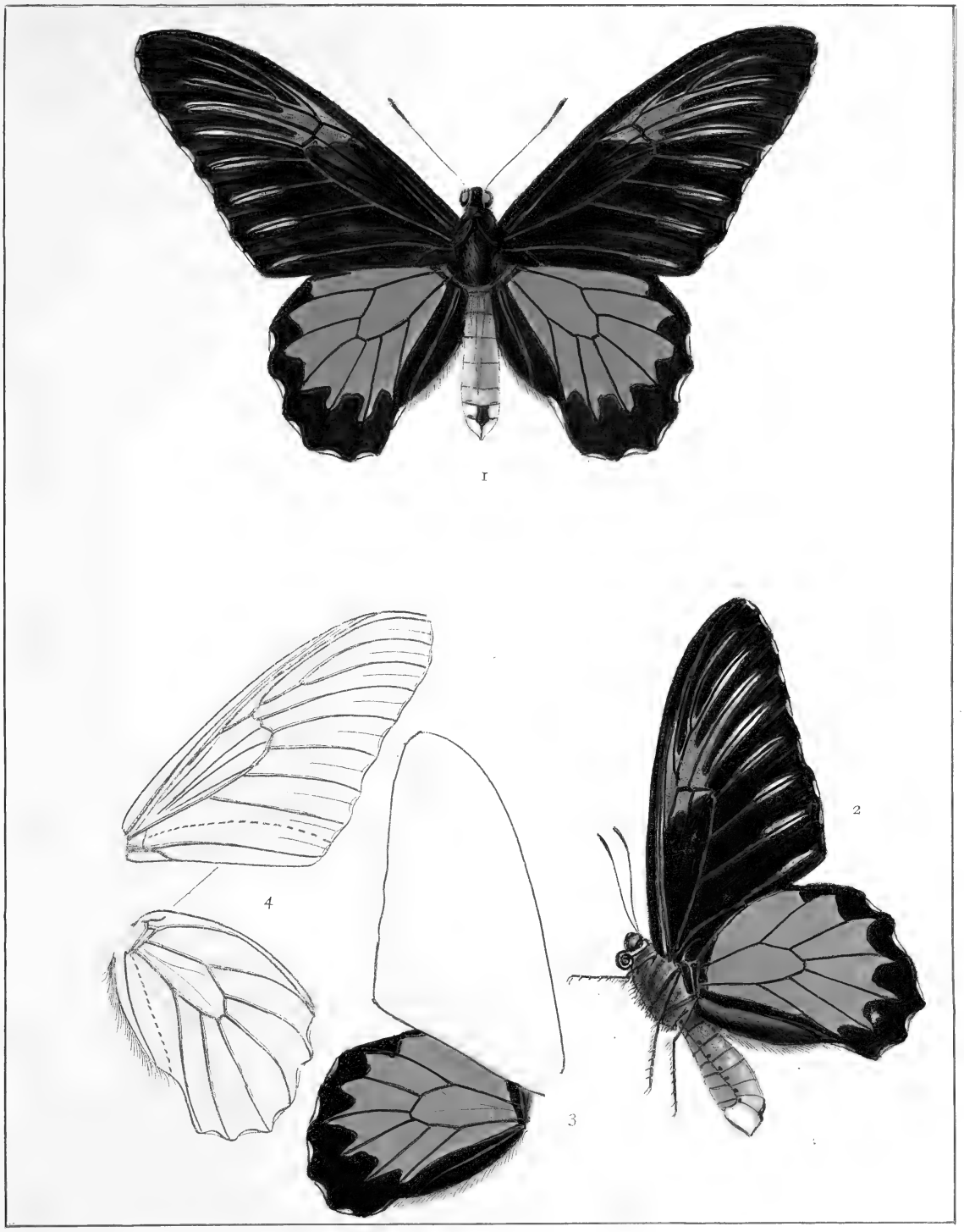
Robt. H. F. Rippon del. et Pinx., 1900. R. Morgan, Impr.

POMPEOPTERA IRIS, *Röbur*, *Figs. 1, 2, 3, 4, 5.*



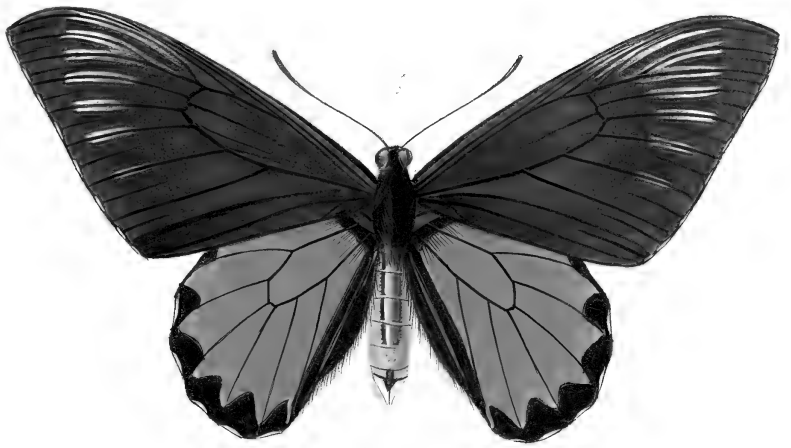
Robt. H. F. Rippon, del et lith. 1906. R. Morgan, Impr.

POMPEOPTERA STAUDINGERI, *Röder; Figs. 1, 2 ♂ 3, 4 ♀.*



Robt. H. F. Rippon, del et lith. 1906.

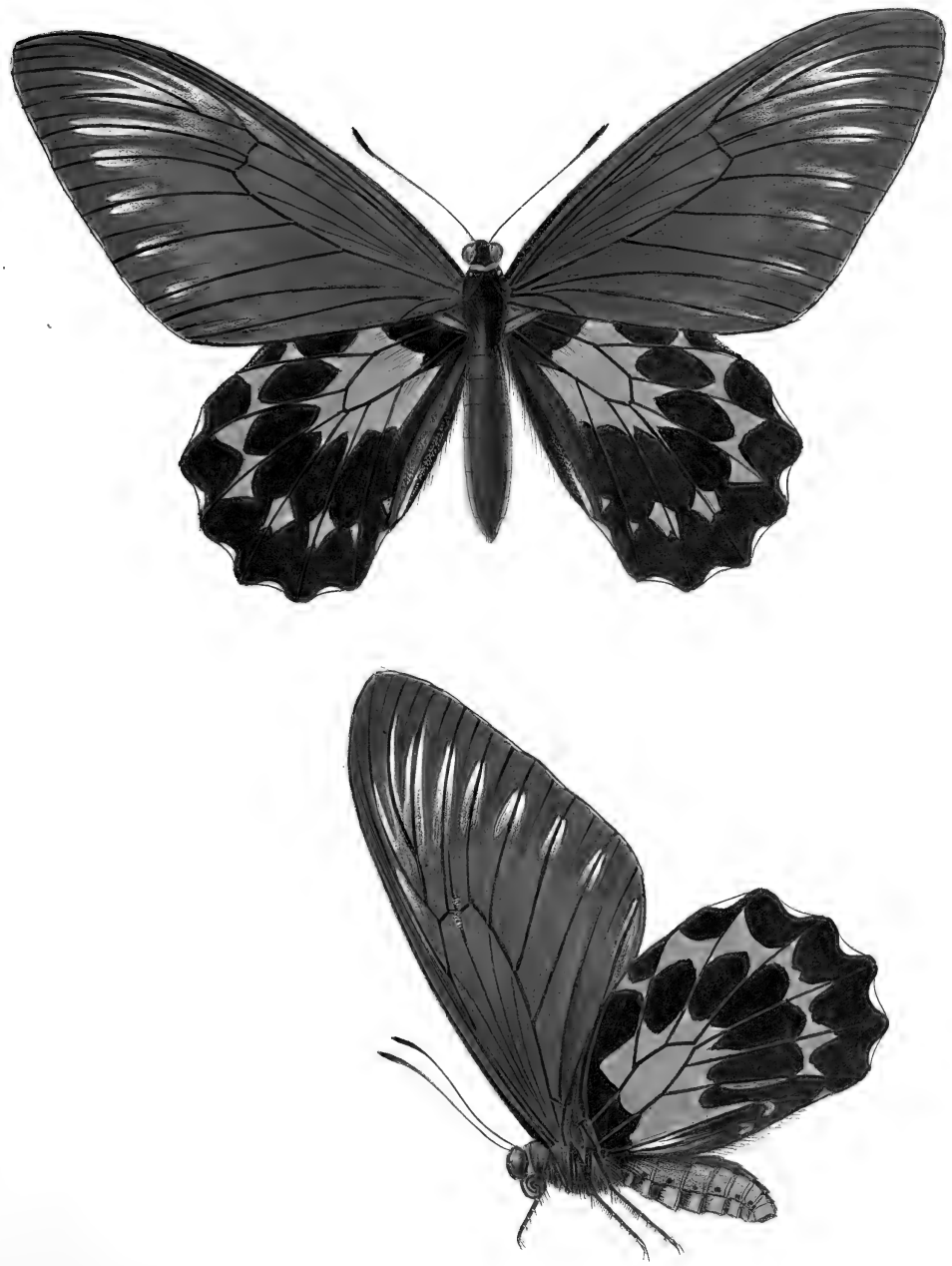
POMPEOPTERA NEOMIRANDA, *Fruhstorfer*, Figs. 1, 2 ♂ ; 3, upper surface of posterior wing, a different setting; 4, Neuration.



Robt. H. F. Rippon del. et Pinx., 1900.

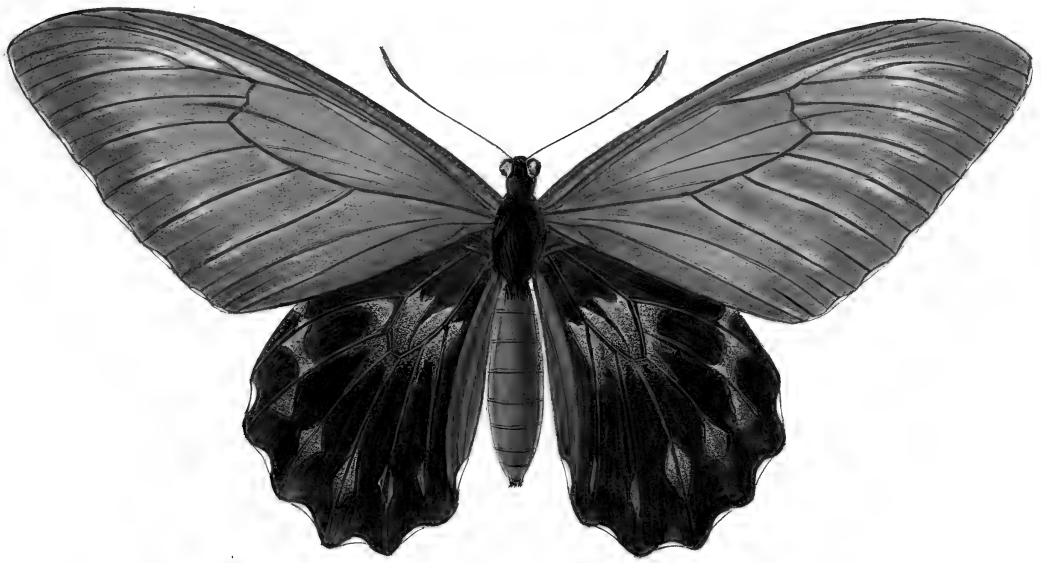
E. Morgan, Impr.

POMPEOPTERA MIRANDA, *Butler*, ♂. *Figs. 1, 2, 3, 4.*



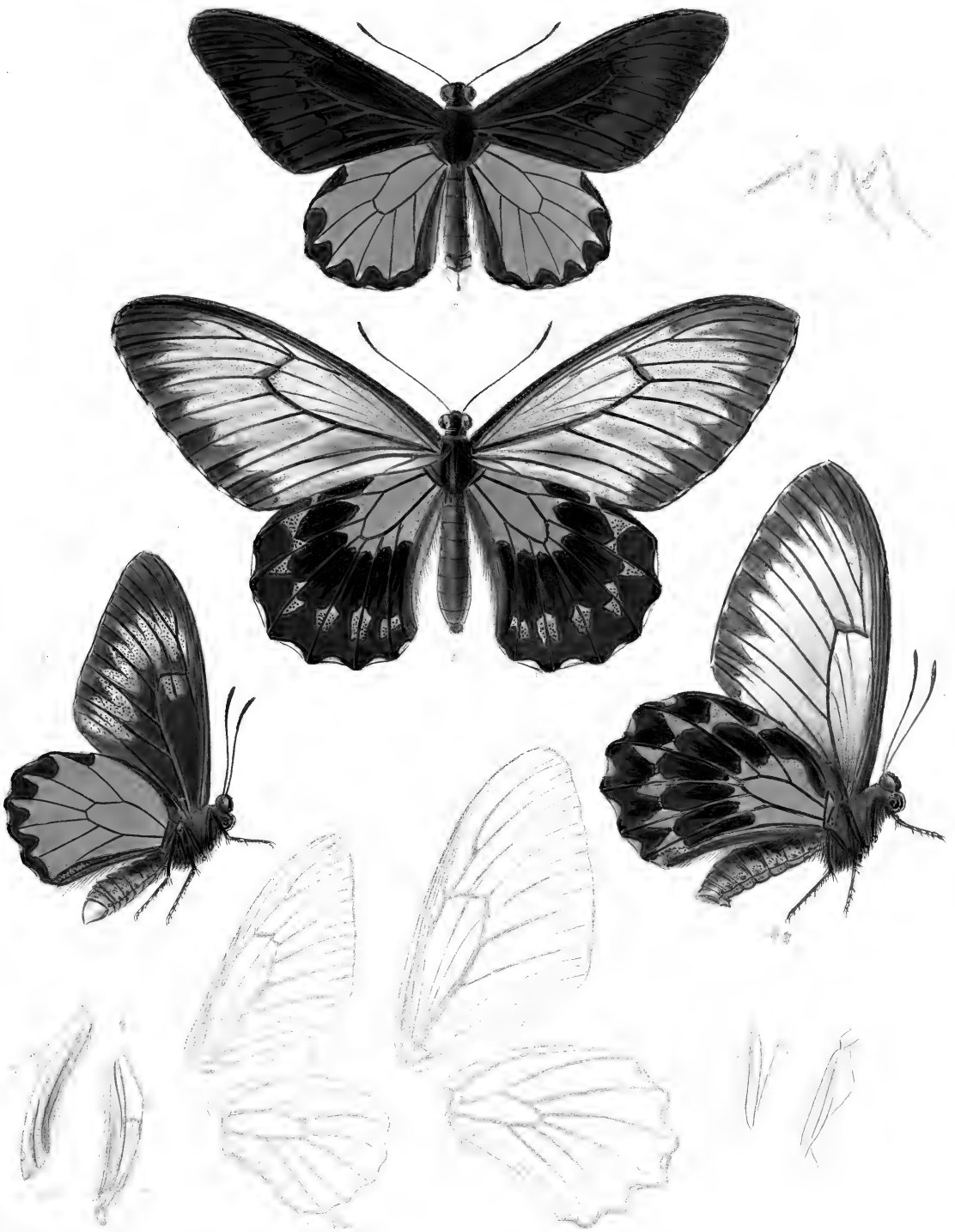
Robt. H. F. Rippon del. et Pinx., 1900. R. Morgan, Impr.

POMPEOPTERA MIRANDA, *Butler*, ♀. *Figs. 1, 2.*



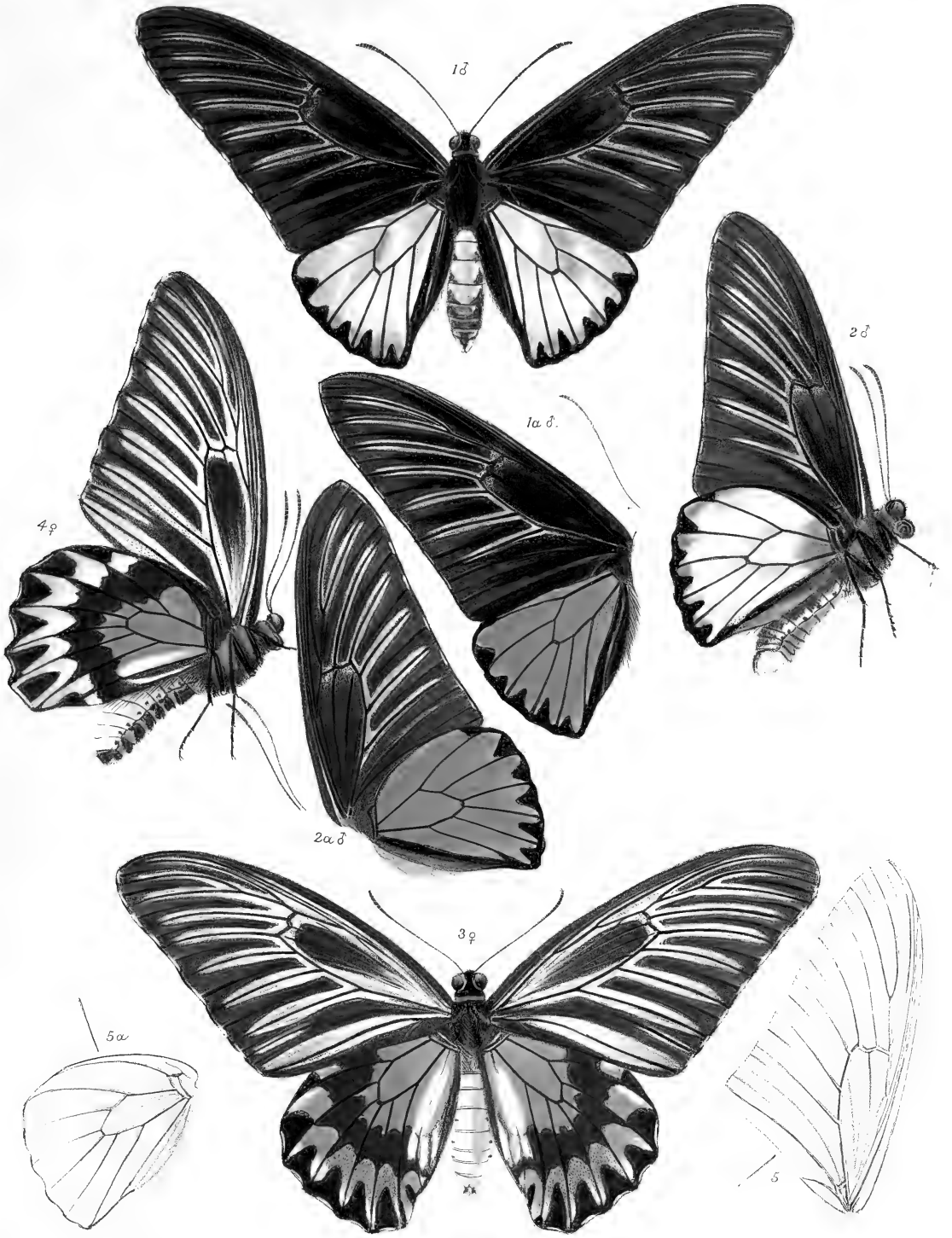
Robt. H. F. Rippon del. et Pinx., 1900. R. Morgan, Impr.

POMPEOPTERA MIRANDA, ♀ *Butler, dark var., Figs. 1, 2, 3, 4.*



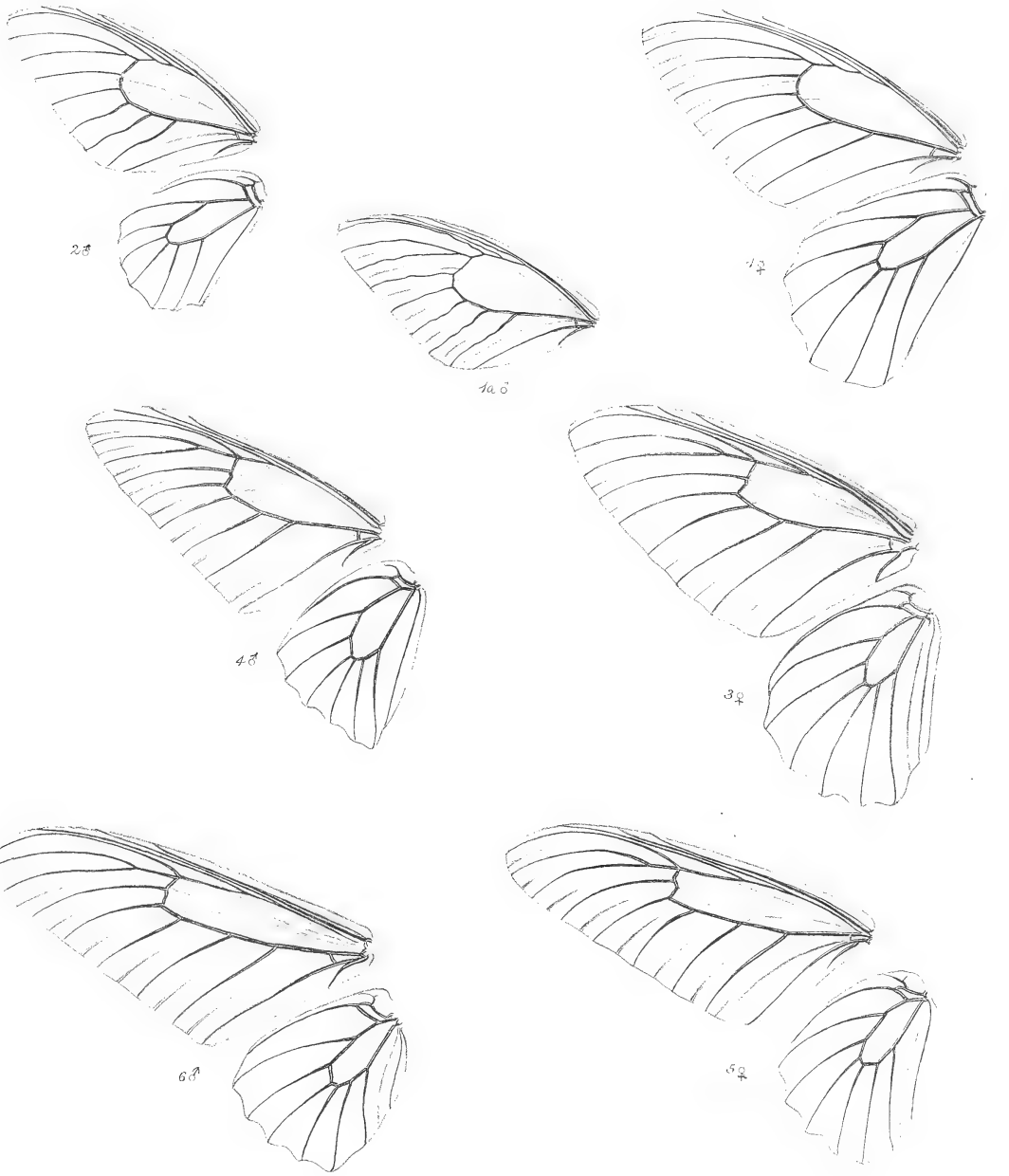
Robt. H. F. Rippon, del. et Pinxit, 1902. R. Morgan, Impr.

POMPEOPTERA ANDROMACHE, *Standg. 1, 2, ♂ ; 3, abdominal fold-pouch of ♂ ; 3a, underside of the same ; 4, 5, ♀ ; 5a, abdominal fold of ♀, upper surface ; 5b, underside of the same ; 5c, legs of ♀ ; 6, Neuration of ♀.*



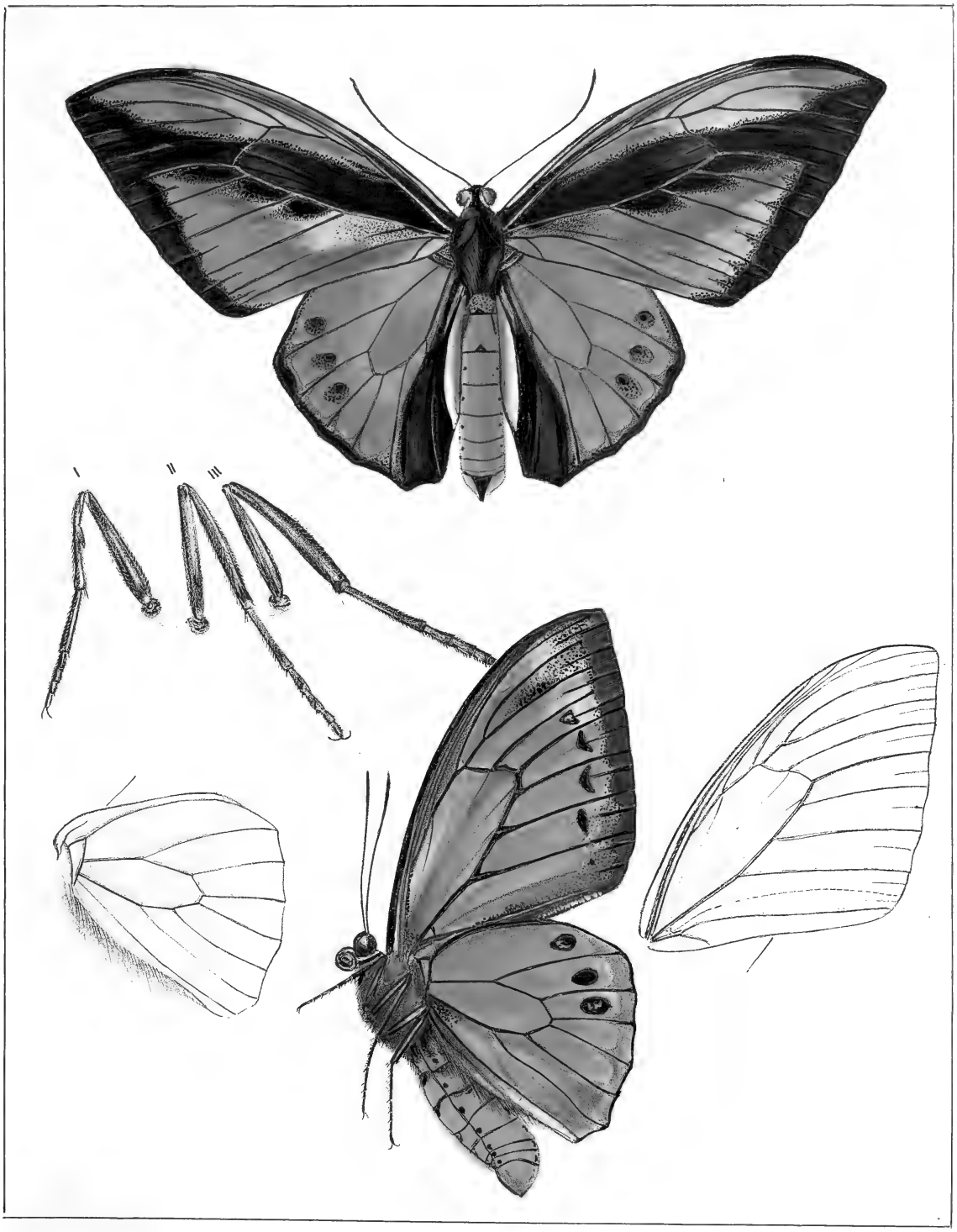
Rob^t H.F.Fippon del.et lith.1896 M&N.Hanhart imp.

POMPEOPTERA MAGELLANUS, *Felder, 1,2, ♂ (Opalescent colours);*
1a, 2a, Xanthochroic cols; 3,4, Felders ♀ type; 5,5a, neuration of ♂.



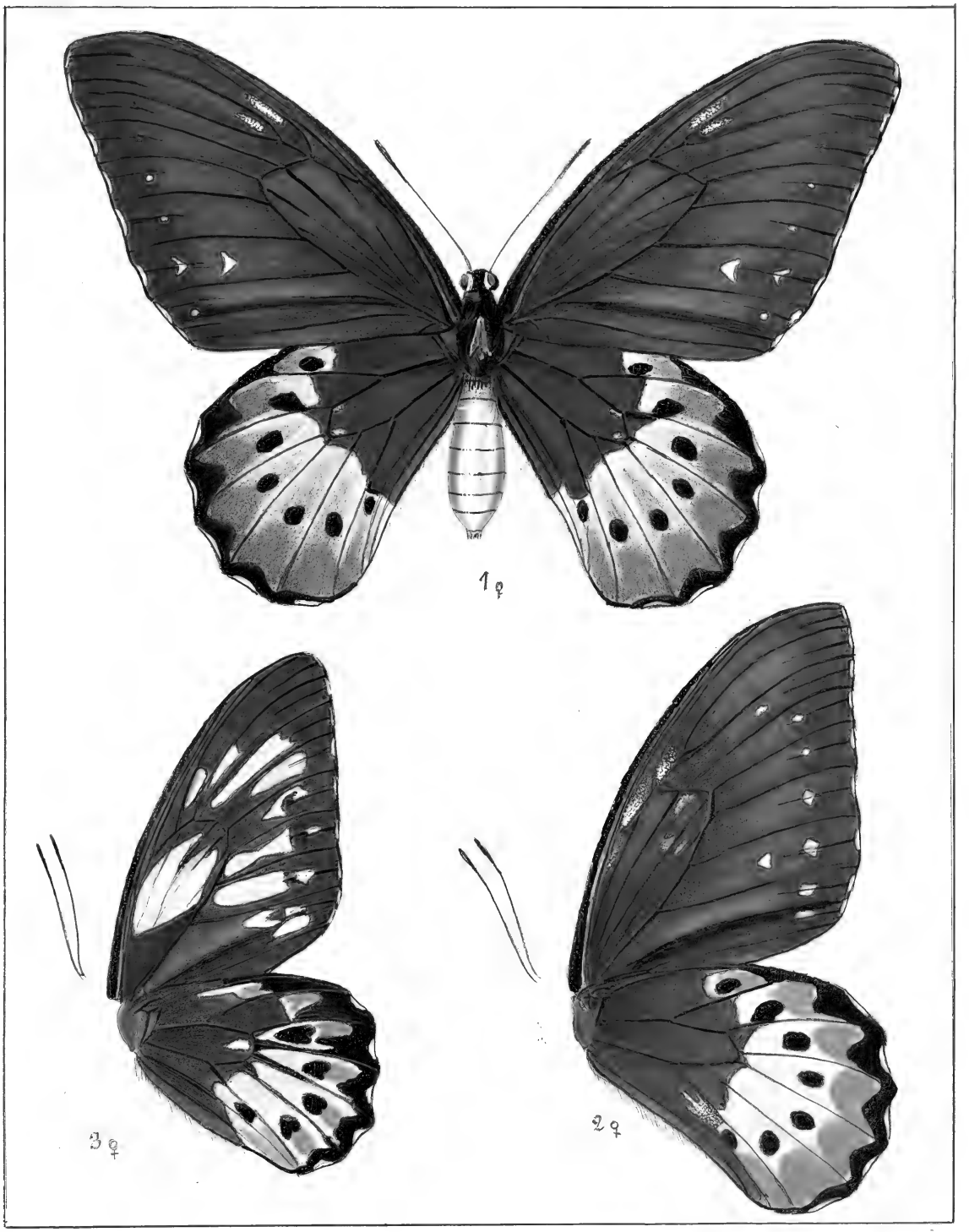
Recent. H.H. Rippon del. et lith. 1890 M&N Hanhart imp.

ORNITHOPTERA RICHMONDIA, *Gray*, 1, 1a, ♂, 2, ♂
POMPEOPTERA PLATENI. *Snellen*. 3 ♀ 4. ♂
TROGONOPTERA BROOKEANA, *Wallace*, 5 ♀ 6, ♂.



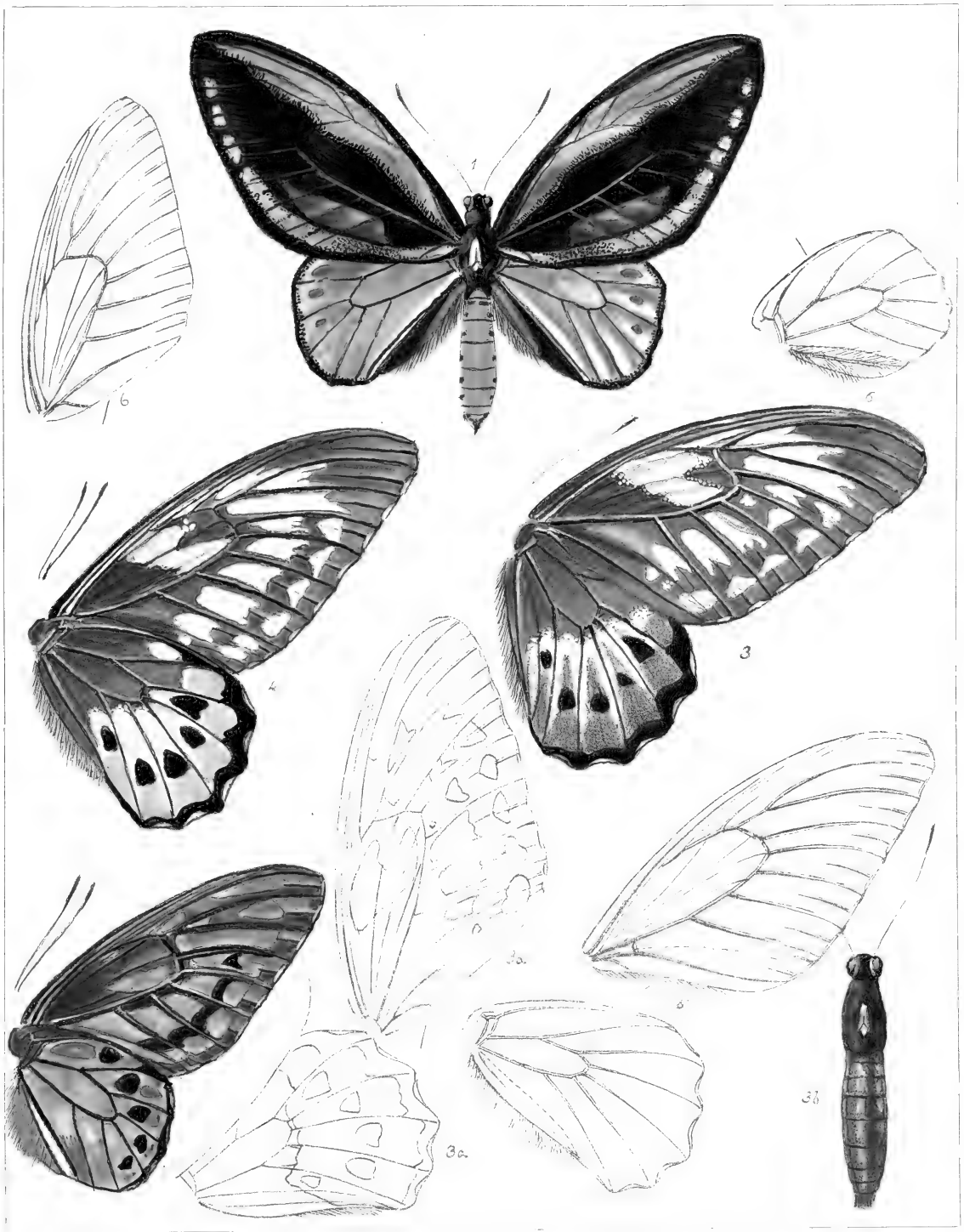
Robt. H. F. Rippon, del. et Pinxit, 1904. R. Morgan, Impr.

SCHOENBERGIA TITAN, H. Grose-Smith. Figs. *1*, *2* ♂, *3*, *4*, *Neuration.*



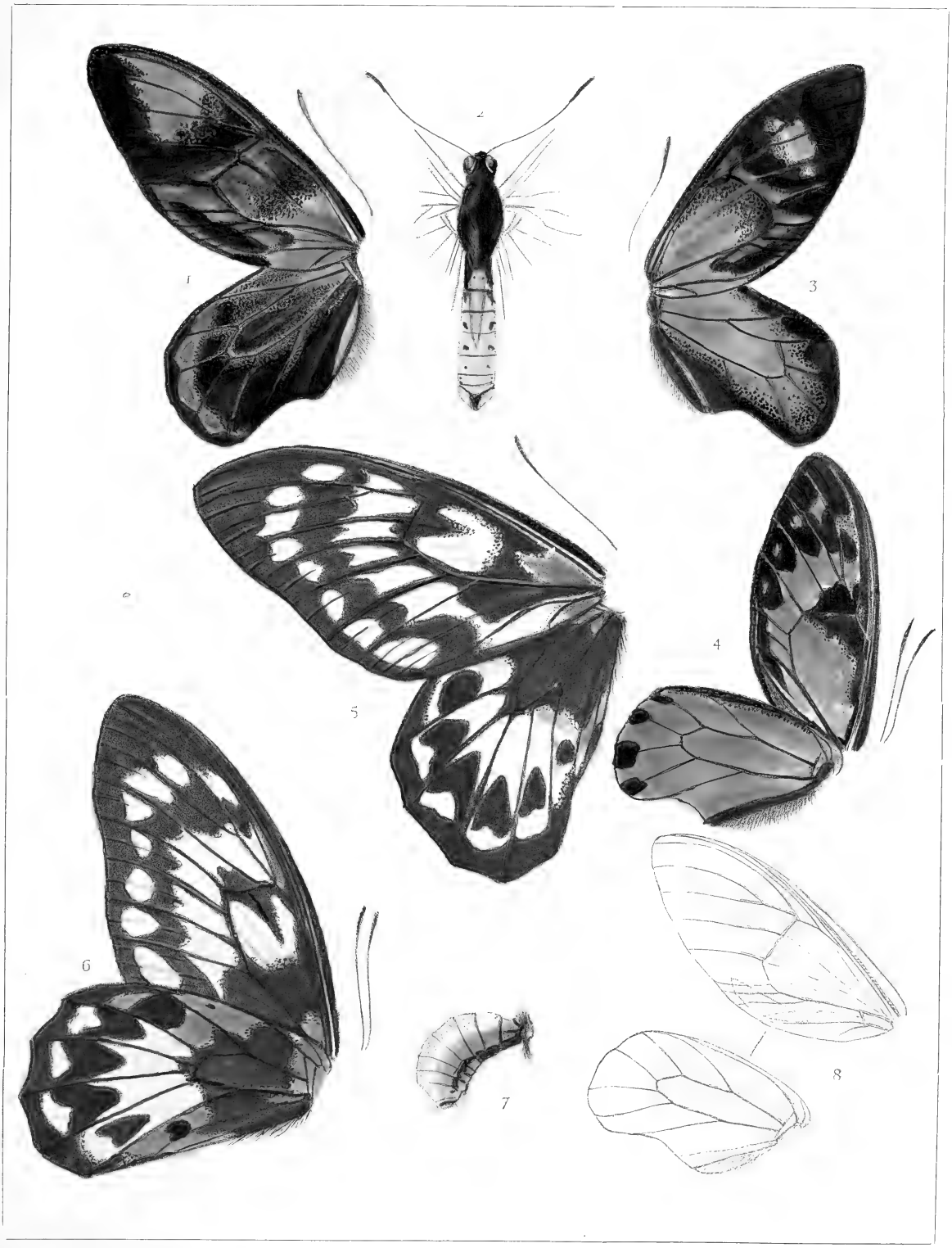
Robt. H. F. Ribbon, del et lith. 1906.

SCHŒNBERGIA TITAN, *Grose-Smith*, ♀. Figs. 1, 2; ORNITHOPTERA POSEIDON, *v. Hecuba*, Roder. ♀ Fig 3.



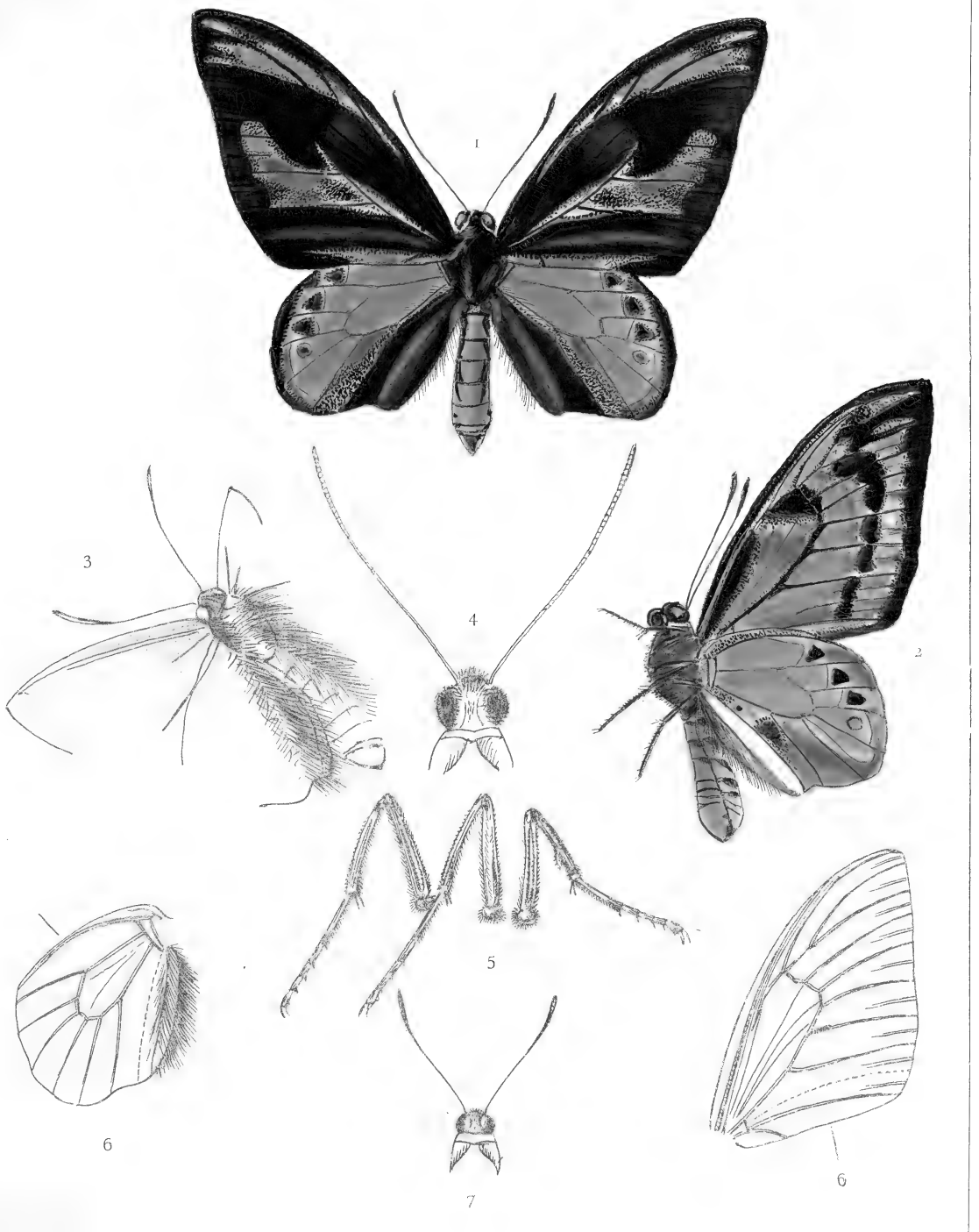
ROBT. H. F. RIPPON, del et lith. 1906.

ORNITHOPTERA .OBIENSIS, *Rippon (or Ney ?)* Figs. 1, 2, ♂ ; 3, 3a, 4, ♀ ; 3b, Body of the ♀ ; 5 Neuration of ♀ ; 6 and of the ♂.



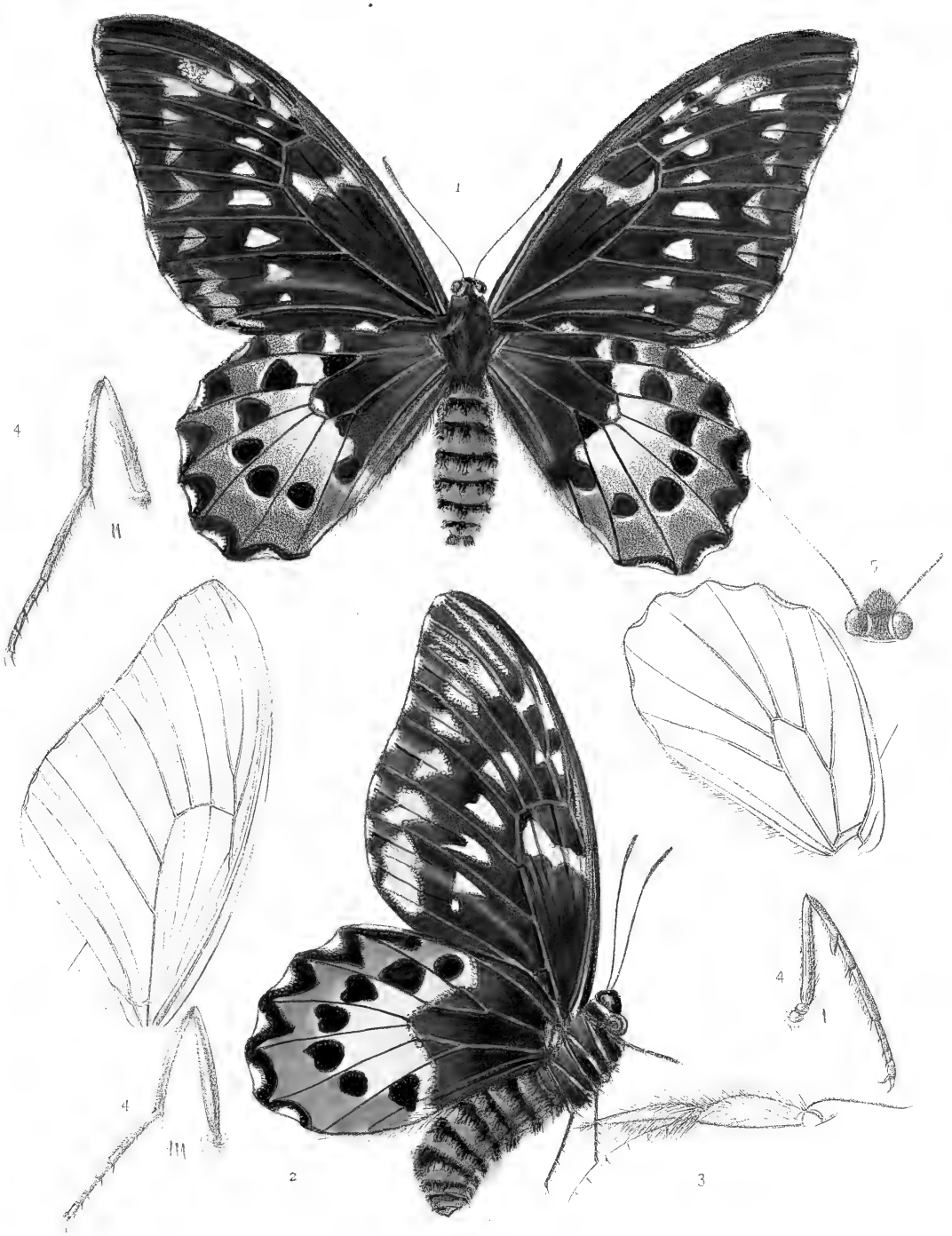
Robt. H. F. Rippon, del et lith. 1906.

ÆTHEOPTERA VICTORIÆ v. *Isabella* ♂, Rothschild, Fig. 1; Body of Isabella, 2; v. *Rubianus*, Rothschild, Figs. 3, 4, ♂; 5, 6, ♀; 7, Abdomen of ♀; 8, Neuration of the ♂.



Robt. H. F. Rippon, del et lith. 1906.

SCHOENBERGIA (PHALÆNOSOMA) CHIMÆRA, *Rothschild*, *Figs. 1, 2, ♂*. Diagram of ♂ seen very obliquely, showing the long hairs of the thorax and base of wings, *Fig. 3*; the head magnified ⅓ths, *Fig. 4*; and nat. size, 7; Neuration, 6, 6; the legs magnified ⅔ths, *5*.



Robt. H. F. Rippon, del et lith. 1906.

SCHOENBERGIA (PHALÆNOSOMA) CHIMÆRA, *Rothschild*, *Figs.* *1*, *2*, ♀ ; *3*, lateral oblique view, showing the long hairs of the thorax and wing bases ; *4*, the legs magnified ¾ths ; *5*, the head ¾ths.

Robt. H. F. Rippon, del. et Pinxit, 1907. R. Morgan, Impr.

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